FOUNDRY TRADE JOURNAL

EST. 1902

WITH WHICH IS INCORPORATED THE IRON AND STEEL TRADES JOURNAL

VOL. 104
No. 2165
Registered at the G.P.O. as a Newspaper

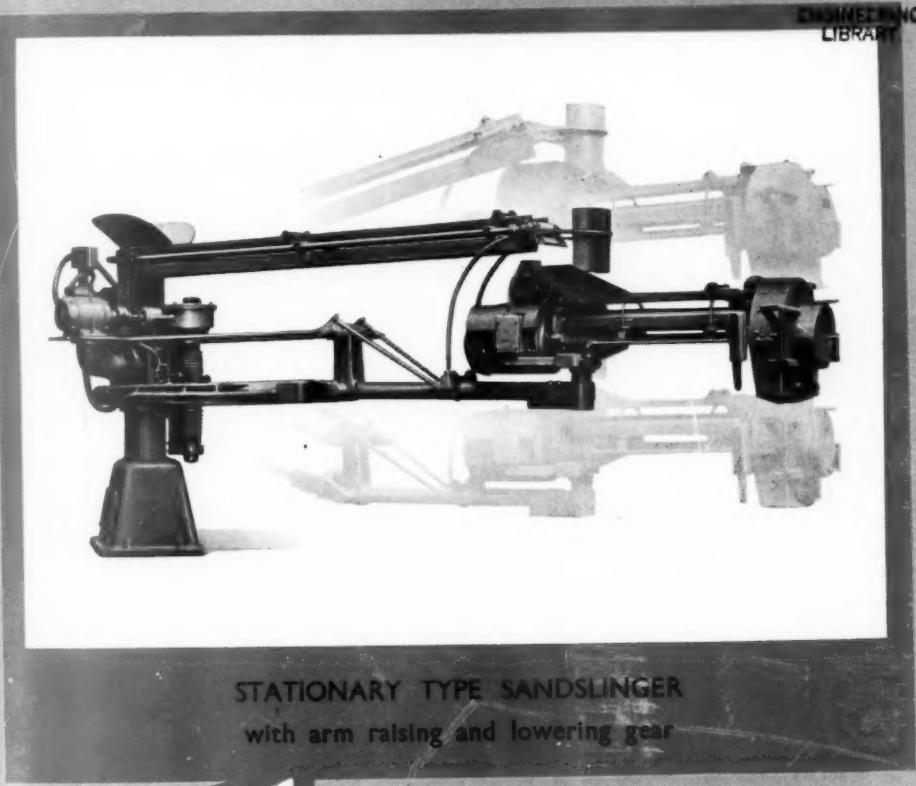
APRIL 10, 1958
Offices: John Adam House, John Adam St., London, W.C.2

Single Copy, 1/-. By Post 1/4. Annual Subscription, Home 52/-, Abroad 60/- (Prepaid)

UNIVERSITY OF MICHIGAN

APR 2 1958

ENGINEERING LIBRARY



STATIONARY TYPE SANDSLINGER
with arm raising and lowering gear

Sandslinger

Foundry Plant & Machinery Ltd
EGLINTON ENGINE WORKS
120 TRADESTON STREET
GLASGOW, C.5

IF YOU EMPLOY THE CO_2 PROCESS AND HAVE NOT ACHIEVED THE OPTIMUM IN RESPECT OF BENCH LIFE, BLOWING AND STRIPPING PROPERTIES, BREAKDOWN AND COST — YOU CANNOT AFFORD NOT TO EXAMINE

GASBOND 25

We shall be pleased to demonstrate

HARMARK
FOUNDRY SUPPLIES

MANUFACTURED BY
HARBOROUGH CONSTRUCTION CO·LTD·MARKET HARBOROUGH
SOLE EXPORT AGENTS FOUNDRY SUPPLIERS LTD·25A COCKSPUR ST·LONDON S.W.1.

FOUNDRY TRADE JOURNAL

Vol. 104 April 10, 1958 No. 2165

Established 1902

Incorporating

IRON & STEEL TRADES JOURNAL

Single copy 1s.; *by post* 1s. 4d.

Annual subscription: home 52s., *abroad* 60s. (*prepaid*)

Editor:
V. C. FAULKNER, F.R.S.A., HON.M.I.B.F.

Assistant Editor: A. R. PARKES, M.I.B.F.

Commercial Editor: P. E. CARDEN.

Advertising Manager:
F. BARRINGTON HOOPER, B.A.

Production Manager:
R. J. LOVELL

Publisher: H. J. DWYER

Circulation Manager: E. T. GRIFFITHS

District Representatives:
G. P. ELLIOTT (Northern Area)
T. H. SMITH (Scotland)

The FOUNDRY TRADE JOURNAL is the official organ of the British Steel Founders' Association; Association of Bronze & Brass Founders; Light Metal Founders Association; Foundry Trades' Equipment & Supplies Association; and the National Society of Master Patternmakers.

AN INDUSTRIAL NEWSPAPERS PUBLICATION

Published Every Thursday by Industrial Newspapers, Limited

BARRINGTON HOOPER C.B.E.,
Chairman and Joint Managing Director

F. BARRINGTON HOOPER, B.A.,
Joint Managing Director and Commercial Director

F. R. LEWIS, *Director*

E. G. WESTON, *Director and Secretary*

JOHN ADAM HOUSE,
17-19, JOHN ADAM STREET,
ADELPHI, LONDON, W.C.2

Telephone: Trafalgar 6171 (Private Branch Exchange)
Telegraphic Address: "Zacatecas, Rand, London."

PRINCIPAL CONTENTS

Page

Advances and Advantages in Shell Moulding

by R. V. Keen

This article, which for experienced foundrymen will be partly a recapitulation of facts with which he is familiar, is published in order to provide for the newcomer a factual introduction to shell-moulding plus information on new developments 41

Foundries in the East Midlands

The series, in which works to be visited during the fifty-fifth annual conference of the Institute of British Foundrymen at Buxton from May 13 to 15 are described and illustrated, continues with short accounts of several other establishments 419

South African Foundrymen Celebrate 21st Anniversary

Summary of Proceedings from the JOURNAL's Special Contributor in South Africa 429

Patron Saints of the Foundry Industry: Part I, England

by L. Faulkner 433

Progrès et Avantages dans le Moulage en Carapace—par R. V. Keen.
Cet article a surtout pour but de donner au nouveau venu dans cette industrie une introduction condensée en même temps que pratique à la technique du moulage en carapace. Pour le praticien qui a déjà acquit une certaine expérience, il sera déjà familiarisé avec les faits indiqués dans le texte 413

"Fonderies dans le East Midland"
Cette série décrit avec illustrations des fonderies qui seront visitées pendant la 55eme conférence annuelle de l'Institute of British Foundrymen à Buxton du 13 ou 15 Mai. Cette série se continue avec de crefs reuseignements concernant certains autres établissements 419

"Les Fondeurs de l'Afrique du Sud célebreut leur 21eme Anniversaire."
Donne un cref apercu de la réunion par le correspondant spécial de notre journal en Afrique du Sud 429

"Saints Patrons dans l'Industrie de la Fonderie.": 1ere partie, Angleterre, par L. Faulkner 433

Fortschritte und Vorteile des Formmaskenverfahrens. Von R. V. Keen.
Dieser Artikel, welcher im Wesentlichen eine Wiederholung der einem erfahrenen Giessereifachmann vertrauten Tatsachen ist, wird veröffentlicht, um Neulingen in der Giesserei eine zusammenfassende und den tatsächlichen Verhältnissen entsprechende Einführung in das Formmaskenverfahren zu vermitteln 413

Giessereien in den East Midlands.
Fabriken, welche während der in Buxton vom 13. bis 15. Mai stattfindenden 55. Jahrestagung des Institute of British Foundrymen besucht werden sollen, sind in einer Artikelserie in Wort und Schrift beschrieben worden. Die Serie wird mit Berichten über verschiedene andere Unternehmungen fortgesetzt 419

Die südafrikanischen Giessereifachleute feiern ihr 21-jahriges Jubiläum.
Unser Sonderberichterstatter in Südafrika gibt eine zusammenfassende Ubersicht über die Verhandlungen 429

Schutzpatrone der Giessereiindustrie: Teil 1, England. Von L. Faulkner 43

Features, News, Commercial Information and Statistics

Leader: The Halifax Industrial Health Report 411
Correspondence: Should Safety Precautions make Machines Foolproof: 412
Borough Polytechnic Appointments 412
FTE & SA Contribution to Conference Fund 412
Maybrey Long-service Awards 412
Law Case 418
Clean and Dark Smoke 418
Equipment and Supplies 428
Contracts Open 434
Notes from the Branches 435
News in Brief 436
Personal 438
Raw Material Markets 439
Current Prices of Iron, Steel and Non-ferrous Metals 440
Company News 442
Forthcoming Events 442
Imports and Exports of Iron and Steel 446
Pig-iron and Steel Production 448

Complete Foundry Efficiency

CONVEYORS by August's LIMITED

Photograph shows: The August's Mould Conveyor (closing to pouring, to cooling, to shakeout), which is a unit of the large August's Mechanised Sand Plant.

Photograph by courtesy of THE INTERNATIONAL HARVESTER CO. OF GREAT BRITAIN LTD., DONCASTER

Sole Licensees and Manufacturers for the British Empire (excluding Canada, Australia and New Zealand) of the Simpson Sand Mixer.

AUGUST'S LIMITED
HALIFAX · ENGLAND
Telephone: Halifax 61245/6/7/8 Telegrams: August, England

J·JM.

FOUNDRY
TRADE JOURNAL

Vol. 104 APRIL 10, 1958 No. 2165

The Halifax Industrial Health Report

The population of Halifax is just under 100,000 and its choice as a " sample " town for investigation could not have been bettered. Working conditions there would be intermediately between some of the oldest manufacturing areas and those in the South of England which have been industrialized during living memory. The range of industries is fairly wide, with textiles predominating. Before publication, we expected to read of the incidence of industrial diseases in the town, but the Report takes quite another form. For instance, initially a survey was made of the buildings in use in the town and out of 797 buildings surveyed, 81 were condemned as unsatisfactory. Here a recommendation is given that new buildings should be " on the right lines."

A chapter is devoted to environmental conditions and, of course, includes the heating systems. Quite sensibly, there is a recommendation that the duty of supervision should be the duty of one particular person. One of the recommendations, in connection with washing facilities, is that propaganda should be directed to the more intensive use and the thoughtful maintenance by the employees. Whilst 573 undertakings exercised good housekeeping, 224 were considered to be unsatisfactory from a cleanliness point of view. Here the Committee recommend the greater use of vacuum cleaning and colour schemes. The section covering seating, carries the statement that men as well as women need seats at their workplaces and that the present law makes no distinction. So far only riveters risk the hazard of occupational deafness, no other trades having a known hazard arising from noise, and in this case, only further study is recommended. The foundries come in for adverse criticism and the following statement is printed:—" Some of the more obvious examples of the possible effects of layout on the health of workers were observed in foundries (both ferrous and non-ferrous) and in machine-tool factories, where the fettling and fine finishing of castings were carried out in the open shop, the dust arising from the process was discharged into the general atmosphere of the factory."

By and large, the foundry industry has been well covered by recent and proposed legislation that up to this point in the Report there is nothing very new. It is in the balance of the Report which covers matters of which notice should be taken. First-aid comes in for criticism and this chapter (9) is well worth reading. The boxes were not always well stocked, whilst in some cases, they were dirty. The provision of " first aiders " was haphazard. It is obvious that the Ministry is looking into the question of better medical supervision in factories—a difficult proposition as there is a shortage of both doctors and nurses. The Ministry would like to see groups of the smaller factories employing co-operatively a medical man or the attachment of general practitioners on a part-time basis. We should have thought that an average doctor was too overworked to give time to additional duties. However, in Halifax, there are 40 general practitioners (who with a population of 100,000 to cater for, or 2,500 per doctor), no fewer than 24 have expressed their willingness to take up part-time employment. Thus, there is more hope for such services than we envisaged.

---

* " Industrial Health—A Survey in Halifax." A Report by HM Factory Inspectorate and Recommendations of the Industrial Health Advisory Committee. Published by HM Stationery Office, York House, Kingsway, London, W.C.2, price 1s. 6d. net.

Correspondence

SHOULD SAFETY PRECAUTIONS RENDER MACHINES FOOLPROOF?

To the Editor of the FOUNDRY TRADE JOURNAL.

SIR,—Our attention has been drawn more closely to your editorial under the heading "New Safety Standard" in the JOURNAL of December 12, 1957.

The article referred to is a clear indication of danger spots on movable items in the foundry, including particularly the head of the impellor-type of sand rammer. May we point out that our Sandrammers have, for a considerable time, been fitted, first, with a safety microswitch, which cuts off the electrical supply to the main impellor motor immediately the head casing is opened. Secondly, a safety shear-pin device is incorporated in the main drive to the impellor head in case metal scrap or "flash" should be delivered into the head on the sand belt. Thirdly, we fit our patented impellor blades, which are of a safety type, and adjustable, with a safety tang fitted for each blade. We therefore believe that of all equipment of this type made anywhere in the world, ours is notable for having been designed with the safety of the operator foremost in mind.

There are some peculiar ideas floating around with regard to factory regulations and safety. For example, we recently received a visitor interested in safety precautions, who asked what would happen if an operator pushed his hand upwards into the impellor-head opening through which the sand is projected. This is about equivalent to asking what happens to a man if he puts his hand into an open fire to see if it is hot! All the arguments for and against safety can be summed up by stating that if you want to get killed, it is very easy to step in front of a motor-car, but people do not do it deliberately unless they have suicidal tendencies.

To conclude, we would ask you to understand that this is a serious observation. We think that there are many misconceptions of safety in the foundry industry. We always design and supply equipment with thoughts of the operators' safety and efficiency well in mind, and endeavour to minimize fatigue. After all, an operator who feels safe with a machine is a better operator—especially under to-day's modern psychological approach to labour conditions.

H. J. THOMPSON,
Sales Manager and Deputy Director.
Foundry Equipment, Limited,
Leighton Buzzard.
March 21, 1958.

[The leading article referred to only dealt with the hazard of the machine head being walked into when stationary and was cited as an obvious case for painting with "tiger stripes."—EDITOR.]

Borough Polytechnic Appointments

Arising from the development of advanced technological courses, the following appointments have been made to the teaching staff of the Borough Polytechnic:—*Senior lecturers in mechanical engineering*: Mr. C. E. T. Maguire, B.SC. (ENG.), and Mr. J. F. Douglas, M.SC. (ENG.), B.SC. (ENG.). *Lecturer in mechanical engineering and in metallurgy*: Mr. R. A. C. Slater. *Senior lecturer in physics*: Mr. G. F. Filbey, B.SC., and *Lecturer in electrical engineering*: Mr. J. S. Vosper, B.SC. (ENG.).

FTE & SA Contribution to IBF Conference Fund

Members of the Foundry Trades' Equipment and Supplies Association, have made group and individual contributions to the 1958 Conference of the Institute of British Foundrymen, to be held at Buxton. Cheques for £373 11s. have been sent, this being the total amount subscribed to the conference fund by the following members of the Association:—

Acme Conveyors, Limited.
Adaptable Moulding Machine Company, Limited.
August's, Limited.
British Industrial Sand, Limited
British Moulding Machine Company, Limited.
Coleman-Wallwork Company, Limited.
Constructional Engineering Company, Limited.
Fletcher Miller, Limited.
Foundry Equipment, Limited.
Foundry Plant & Machinery, Limited.
Foundry Services, Limited.
FOUNDRY TRADE JOURNAL.
General Refractories, Limited.
Harborough Construction Company, Limited.
J. W. Jackman & Company, Limited.
A. Lakin & Son, Limited.
Marco Conveyor & Engineering Company, Limited.
Paterson Hughes Engineering Company, Limited.
G. Perry & Sons, Limited.
Pneulec, Limited.
E. A. Roper & Company, Limited.
Spencer & Halstead, Limited.
Sterling Foundry Specialties, Limited.
Sternol, Limited.
Colin Stewart, Limited.
E. Tallis & Sons, Limited.
Isaac & Israel Walker, Limited.
Thos. W. Ward, Limited.

Maybrey's Long-service Awards

Recently an interesting ceremony took place at the head office of H. J. Maybrey & Company, Limited, aluminium founders, of Worsley Bridge Road, Lower Sydenham, S.E.26. Mrs. M. C. Maybrey, managing director, presented gold watches to six members of the staff who had each completed over 25 years' service with the company. The recipients were:—Mr. J. H. Begg, Mr. B. J. Myson, Mr. W. J. Foskett, Mr. W. Edwards, Mr. J. G. Ehmann, and Mr. T. Allen.

Thanks were expressed on their behalf by Mr. J. H. Begg, who mentioned the satisfaction all felt in the knowledge that Mrs. Maybrey was undoubtedly carrying on the policy of the founder, Mr. H. J. Maybrey; he felt that it was an appropriate time to think for a moment of him and of the rapid growth of the firm from those early days. The ceremony finished with a toast to the firm and its continued success in the future.

Further Step in Newton, Chambers' Merger

The offer made by Newton, Chambers & Company, Limited, Thorncliffe, Sheffield, to acquire the whole of the preference and ordinary share capital of Ransomes & Rapier, Limited, Ipswich, has been accepted by 93 per cent. of the holders of ordinary shares, 98.47 per cent. of the holders of the "B" cumulative preference shares, and 97.5 per cent. of the holders of the 6 per cent. cumulative preference shares in Ransomes & Rapier.

The necessary resolutions by Newton, Chambers for an increase in its share capital have been passed by shareholders and the offer has now become unconditional. Five Newton, Chambers' directors will be elected to the Ransomes & Rapier board and two Ipswich directors will join the Thorncliffe board.

Advances and Advantages . . . in Shell Moulding

By R. V. Keen

Whilst the majority of foundrymen will be thoroughly conversant with the background and principles of the shell-moulding technique as described in the early part of the following article it is felt that for entrants and newcomers to the trade it will form a useful introduction to the process and its particular advantages for certain classes of work. The Author presents his material in the form of an account of shell moulding as it is carried out at the foundry of E. Green & Son, Limited, of Wakefield, and emphasizes benefits resulting from increased mechanization of certain stages.

As, of course, is well known to founders, the shell-moulding technique was first developed in 1937 by Croning in Hamburg. He experimented with methods of manufacturing moulds and cores by applying a coating of resin-bonded sand to a hot metal pattern. Since then, the process, which has brought many advantages to the foundry industry, is being used in this country with considerable success. Shell moulding undoubtedly represents a departure from traditional foundry techniques. It may be presumed that experimentation was continued in Germany during the war, but it was not until after the war that British scientific teams discovered the first information regarding the shell-moulding process. Since then the process has been perfected and it is now in full commercial use in this country.

It was found that by using the new technique numerous advantages were gained. Moulds possessing high strength were obtained which ensured an excellent finish to the castings; waste was avoided and machine time saved. These factors led to greatly reduced foundry costs and substantial increases in productivity. Such advantages as those mentioned above are typified in the foundry of E. Green & Son, Limited, of Wakefield. Here, quite apart from the production side, experimentation in shell moulding is carried out, particularly with regard to the mechanization of the process.

Materials

Resin

At E. Green & Son, Limited, a new resin* is

* Cellobond J.X. 5040, manufactured by British Resin Products, Limited

FIG. 1.—*During casting, resin is burnt out of the shell mould as can be clearly seen in the photograph. Once the metal has cooled, any unburnt corners, etc., are reclaimed.*

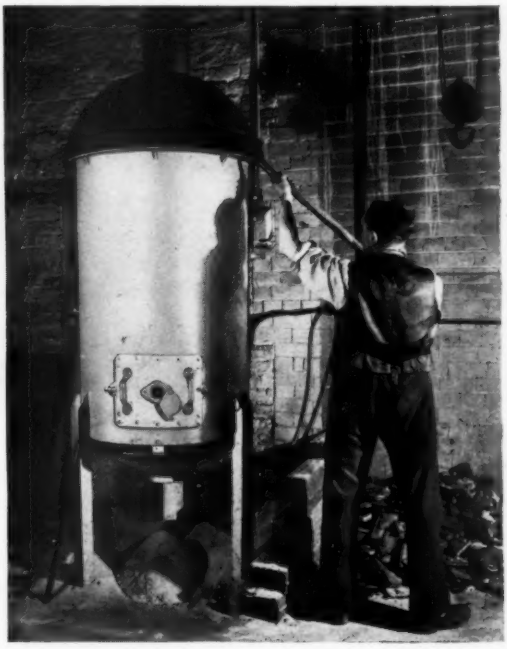
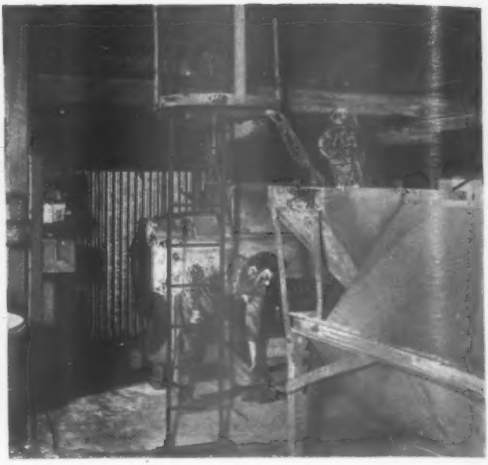


FIG. 2.—*Conventional gas-fired reclaimer; the remainder of shells are prepared for re-milling as reclaimed sand.*



FIGS. 3 AND 4.—*By the methods employed at the foundry of E. Green & Son a considerable quantity of sand is reclaimed by removing it from the mould conveyor after casting and passing it through a shake-out (left) and (right) machinery used for precoating sand is shown, including hoppers, a Z-blade mixer, grader and screw conveyor.*

used which has been specifically designed for the cold coating of sand for shell moulding, and the process is essentially one of simple mixing without the use of heat. This last statement must, however, be qualified as heat can be used to speed up the process. When mixed with sand the liquid resin, which is of the phenolic type, forms a thin film around each grain. Sand coated with this material produces, it is claimed, strong shells, free from warping and with a much reduced investment time.

Sand

Sands which have been used for shell moulding with excellent results include Chelford Fine, Redhill H, Redhill F, Southport, King's Lynn, Congleton, and Harrogate No. 2. However, any sand which has been found suitable for use in the shell-moulding process may be resin coated. It has been found also that for some mixes a coarser sand may be employed than would be normally used for powder resin mixes.

Reclaimed sand

As the metal cools in the mould after casting the resin is almost completely burnt out (See Fig. 1), leaving a residue of what may correctly be called reclaimed sand. Unburnt corners, etc., of the shells are dealt with separately in a conventional gas-fired reclaimer (see Fig. 2) and the recovered sand is used again in the coating mill. The advantages are obvious. The shell strength is increased when reclaimed sand is used and the sand costs are much reduced. Also much of the residual heat in the reclaimed sand is retained and is of great assistance in shortening the precoating operation.

Processing—Shell Mould Manufacture

A 200-lb. capacity mill, a Z-blade mixer, is in operation at the company's works and sand is fed into the mill by means of two hoppers. New sand is lifted into the hoppers in an electric bucket-hoist, whilst reclaimed sand is passed from a magnetic separator through a shake-out (see Fig. 3) on to a conveyor belt to the hoppers. The mill (see Fig. 4), which is kept at a temperature of 200 deg. F., is first of all loaded with sand from the hoppers. The resin is then added together with the curing agent (hexamine). Mixing is continued for six minutes during which time the mass changes from a dough-like consistency to a powder (see Fig. 5). This powder, containing some agglomerates, is fed by screw conveyor to a grader. Oversize particles are returned to the next mix and the perfectly free-flowing coated sand is conveyed to the shell-moulding machines. Regarding the mill itself, it is interesting to note that an air-injection unit is employed which works in conjunction with the mill. This assists in the removal of the solvent released from the mix by the heat.

Most types of equipment available to foundries can be used for sand coating. Process times and procedures will vary, however, according to the type of equipment used. For precoating the ratio of resin to sand is not fixed. This must be decided by the individual foundryman bearing in mind his requirements in respect of shell and core strength, weight of casting, metal to be cast and method of pouring. Experience has shown that the strength of the shell is related directly to the quantity of resin added. Between 3 per cent. and 6 per cent. on the weight of sand is adequate in the manufacture of a shell mould and a little less for cores (see

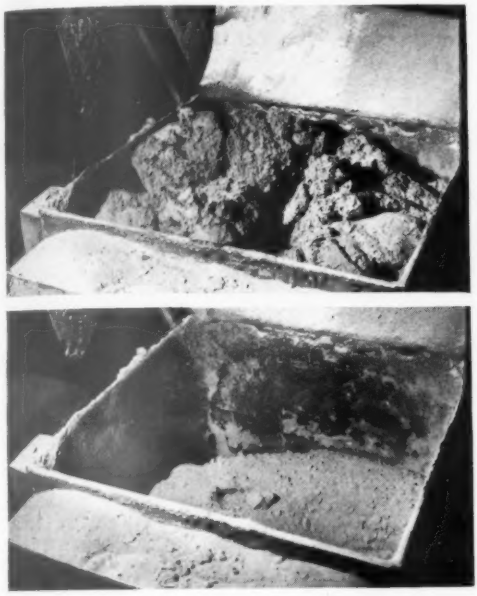


FIG. 5.—*After resin and catalyst have been placed into a precoating mix, milling continues for six minutes. Here the two main stages of the process are shown—after two minutes (top) when the mix is a dough-like mess and after six minutes (bottom) when the mix is complete and in powder form.*

Fig. 7 for the relationship between transverse strength and resin content). When mixing is complete, the sand is transported to the various shell-moulding machines.

Machinery

When shell moulding is carried on to any appreciable extent the precoating of sand is found to be of great value. Costs must obviously be lower than when buying precoated sand from an outside source. With precoating machinery on site, local sand can be frequently utilized. Moreover, reclaimed sand can be used. This would otherwise be impossible. From these points alone it can be seen that financially, as well as from a production point of view, a substantial saving may be obtained.

The SP. 1000 shell-moulding machine, in full production, is capable of manufacturing shells, 20 in. by 30 in., which will provide moulds for up to 160 castings per hour (see Fig. 6). This large shell is broken into four parts, two of which provide a complete mould. It is fully automatic and once set requires no further adjustment or attention. As may be appreciated from the number of shells it can produce per hour, the great value of this machine lies in its speed. The automatic coreblower, which works in conjunction with the large shell-moulding machine enhances its value still further. Designed by and in use at E. Green and Son, Limited, it is capable of producing cores at the rate of 400 an hour to the closest tolerances. The use of this blower does away with the bottleneck once experienced when the shell-moulding machine was manufacturing moulds faster than cores could be produced.

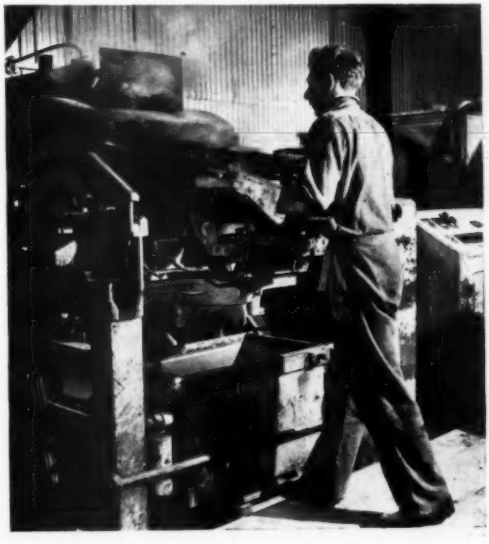
The automatic coreblower manufactures barrel cores which have no flash as they are made in one piece coreboxes, the cores being ejected. Each box is independently heated by electric elements and excess sand is returned to the hopper above by means of an air-stream pipe. An important point is that the whole shell-moulding process is so speeded up by using these machines together that much of the heat is retained in the shell. This greatly assists the assembly operations. Glued moulds are placed straight into a press and from there they are removed on to a trolley and are ready for casting.

With the Anson Double Unit (see Fig. 8) the procedure is entirely different as no form of mechanization is employed, but it possesses advantages of its own. The oven is gas-heated and easily controlled. Patternplates can be changed in a matter of minutes and little or no maintenance is required. The machine is fundamentally so simple that any trouble or defects are easily repaired. As it is a double unit the operator is able to invest one shell while the other is curing in the oven.

Processing

Pattern temperatures should be between 180 deg. C. and 220 deg. C. though temperatures up to 250

FIG. 6.—*Large shell-moulding machine. The mould is removed from the stripping pins by means of a specially-designed fork. Whilst one shell is broken and assembled, the machine, which is fully automatic, begins the next cycle.*



Advances in Shell Moulding

deg. C. are suitable. Within this range the rate of build-up for varying investment times is:— Five sec.—0.21 in.; 10 sec.—0.27 in.; 15 sec.—0.31 in.; 20 sec.—0.35 in. A slightly higher rate of build-up may be expected above 220 deg. C. and thickness will vary slightly according to the resin content used.

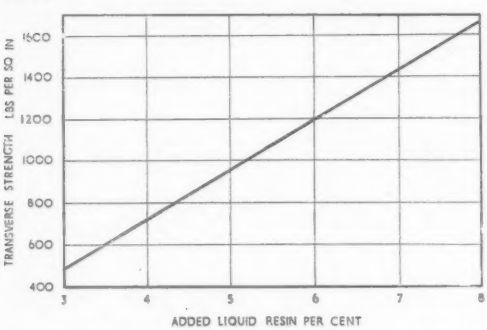


FIG. 7.—*Graph showing relationship between transverse strength and resin content.*

The patternplate itself requires only slight lubrication as there is little likelihood of the resin migrating to the plate surface. Sticking is also unlikely and the plate needs little or no cleaning. Excess lubricant is detrimental to the production of satisfactory shells, in fact, if too much lubricant is added there is a very good chance that the shell will fall away from the plate after investment.

Average investment times are from 16 to 18 sec. This is about half the time necessary to give an equivalent shell thickness to that obtained when powder resin mixes are used. Curing time is approximately 20 sec. at a temperature between 180 deg. C. and 220 deg. C. Shell thickness is roughly $\frac{5}{16}$ in. and when manufacturing a cylindrical casting the company in question achieved a unique time of four minutes from completion of the coating process to the actual casting operation. This standard speaks for itself in terms of production and costs in shell moulding. With all parts of the process working correctly a complete sand cycle takes only 25 minutes. This includes everything from the original mixing to replacing the reclaimed sand in the hopper.

Shell Cores

Blown shell cores are playing an increasingly important role in assisting production. As has been stated above they are now being blown automatically. In the early days of shell moulding the use of powder resin mixes led to several troubles. Some of the difficulties of resin segregation were overcome by the use of so-called "wetting agents" such as dibutyl phthalate, liquid phenolic resins and paraffin oil. The results, however, were not fully satisfactory, and it was not until the advent of precoated sand that core-blowing made any substantial headway.

With precoated sand release agents are no longer necessary and the difficulties previously encountered in obtaining an even powder resin mix have been overcome. The build-up is exceptionally uniform when using a precoated sand, and the resin content can be reduced. The tendency is for the fine sand to be blown to the outside walls of the core and this is yet another reason for the very good finish.

Shell cores can play a big part in green sand foundry work as they can be rapidly manufactured and show a considerable saving in material on a

FIG. 8.—*Shells ejected from the Anson Double Unit away to show the cores and the exceptionally even large automatic machine. (left) and, (right), a casting with its shell mould cut build-up. This type of mould is produced on the*

weight basis. No elaborate baking ovens are necessary and knockout is greatly simplified.

Conclusion

Machinery should be employed wherever possible, for shell moulding is essentially a mass-production process. It is only by mechanization that an appreciable profit margin will be shown over existing green-sand moulding methods, and only in this way can the shell-moulding industry develop successfully. It follows from what has been said above that its future is tied up with the following factors: utilization of reclaimed sand; use of precoated sand, manufactured on site if possible; and, finally, employment of adequate and up-to-date machinery.

Blast-furnace Construction in US

The high capital cost of blast-furnace construction in the United States has now reached a point where pig-iron producers think it advisable to pursue other methods to increase output. Activity in development of direct-reduction processes, has caused hesitation on the part of operators lest a practical substitute for the blast-furnace emerges. In the circumstances it is considered advisable to seek expansion of iron production by ore beneficiation and oxygen additions to blast, rather than by embarking upon costly furnace construction.

The present trade recession doubtless is causing concern, and also the possibility that the existing building programme may provide more capacity than will be required in the immediate future. Typical of the current trend is the target set by Weirton Steel Company for its four blast-furnaces, based on improved operating technique. The aggregate daily output some time ago was some 5,750 tons; soon this is expected to reach 7,500 to 8,000 tons, coke rate falling to between 1,300 and 1,350 lb./ton of iron.

This concern has been a pioneer in using blast enrichment with oxygen to increase output, additions of up to 4 per cent. having resulted in 19 per cent. more iron. The ferromanganese furnaces at the Dequesne Works of the United States Steel Corporation is expecting to raise the daily output of the ferro-manganese furnaces from 700 tons to 875 tons by 6 per cent. additions of oxygen to the air. These and similar examples represent the course at present being adopted to increase pig-iron production in America.

Lancashire Steel Corporation Reorganized

A new wholly-owned subsidiary, Lancashire Steel Manufacturing, Limited, has been formed by the Lancashire Steel Corporation, Limited, and the latter company has been converted into a holding company. The new subsidiary, it is stated, has an issued capital of approximately £15,000,000.

The group's manufacturing and trading activities will now be carried on by the new subsidiary, by the principal existing manufacturing subsidiaries, Rylands Bros., Limited, and the Whitecross Company, Limited, and by other subsidiary companies.

Moulds for Continuous Casting*

The first Soviet experimental industrial establishment for the semi-continuous casting of steel commenced operation in 1951 in the Red October works, and is in use for the casting of stainless-steel billets of section 150 by 600 mm. (6 in. by 24 in.) and of length 6 m. (nearly 20 ft.).

Since the first operation of the plant, a series of improvements have been made, of which the most valuable has proved to be the replacement of the fixed mould by one which may be given a reciprocating motion. Experience has enabled a comparison to be made of the three types of mould in use at the present time for the semi-continuous casting of steel, *i.e.*, fixed mould, spring-mounted mould and the mould with a reciprocating motion.

With a fixed mould continuous motion of the metal causes a hardening of the crust, which tends to tear away the wall of the mould. With increase of speed of drawing, the thickness of the crust decreases, and an investigation of the conditions inside the mould, using radioactive isotopes of phosphorus, has shown that with a drawing speed of 1,100 mm. per min. the crust has a thickness of only 5-6 mm.

Moulds of the second type have generally been supported by four spiral springs, each with the same characteristics, whose compression is proportional to the frictional force between the billet and the mould. With this arrangement, an increase of friction does not necessarily cause tearing of the skin of the billet, since the mould can move at the same time at the billet.

The third type of mould has a reciprocating motion in a vertical plane. During the pouring process, the mould drops by some 20-25 mm. (¾ to 1 in.) with a speed equal to that of the drawing of the billet, and then returns to its original position at a greatly increased rate. During the sinking periods of the mould, the skin of the billet is fixed relative to the wall of the mould, and this should theoretically prevent any fracture of the crust occurring. During the periods of raising the mould, the possibility exists of tearing of the crust in the region of the meniscus, but the speed of the mould is about four times that of drawing, giving a relative speed between mould and billet of some five times the speed of drawing.

Experience with the use of this self-aligning reciprocating mould shows that it is an effective method of overcoming the problem of fracture of the skin between billet and mould. It appears to have further application to the continuous as well as the semi-continuous process of casting.

* The article by C. I. Kozlitin and L. N. Kolyibalov, from which the above is abstracted, appeared in *Stal*, 1957, No. 3.

H. & C. DAVIS & COMPANY, LIMITED—Mr. E. E. Burchell, managing director, has been appointed chairman of the company in place of Mr. A. Ethell, who has resigned. Mr. P. A. Logan, general manager, has been appointed to the board.

Law Cases

Firm and Electricity Board fight on

The decision of Lord Guest in the Glasgow Court of Session to allow a proof before answer in the action by British Oxygen Gases, Limited, for payment of £9,995 against the South of Scotland Electricity Board has been upheld by the Second Division. The dispute, which originated in 1954, arose over the method of charging for high-voltage current supplied to the company. The original litigants, the British Oxygen Company, Limited, and the South-West Scotland Electricity Board, were both predecessors of the present parties.

In 1954 it was alleged that the board's tariffs showed undue discrimination against high-voltage consumers and the plaintiffs claimed payment of £10,000 in respect of overcharges. In December, 1954, the late Lord Hill Watson dismissed the action and plaintiffs appealed to the Second Division which allowed a proof. The board then appealed to the House of Lords and in 1956 the Lords held the case relevant and sent it back to the Court of Session for proof.

When the action again came before Lord Hill Watson in May, 1957, he heard fresh legal debate and granted declarator that the tariffs under which the board had been charging the company showed undue discrimination against it. This decision was appealed against and proof in that case is still pending.

Fourth Tariff Involved

In July, Lord Walker granted interim interdict on the application of British Oxygen Gases, Limited, a wholly-owned subsidiary of the original plaintiffs, against the South of Scotland Electricity Board putting into effect a tariff which, it was submitted, was objectionable for reasons similar to those applying to the tariffs under dispute. There was again appeal to the Second Division, which agreed with the recall of interim interdict.

The new action, for declarator and permanent interdict, came before Lord Guest, who allowed a proof. The appeal was heard last month, and the division has now upheld the allowance of a proof before answer. In his judgment, Lord Thomson, the Lord Justice-Clerk, said that it was simply another round in the same struggle. On the old points nothing more could be said; they would reach the House of Lords in due course. Not only had both the parties changed since 1954, but the statute which regulated the relationship between them had also been changed.

The earlier action was concerned with three tariffs and the present proceedings with a fourth. The company said the fourth was just another tariff on the same lines; the board said it was on a different footing. He was very much impressed by the defendants' argument that the plaintiffs had not made it clear in what way the fourth tariff differed from the other three. Lord Guest had accepted this argument, but allowed the plaintiffs to proceed on the alternative case that the fourth tariff, taken on its own merits, unduly discriminated against them, because it failed to maintain the differential to which they were entitled.

Practical considerations seemed to point strongly towards letting the whole thing go into the melting pot. Lords Patrick, Mackintosh, and Blades, concurred.

£4,000 for Fractured Spine

A Scottish steelworks labourer, Mr. William Park, was awarded £4,000 damages in the Court of Session, Edinburgh, in an action against his employers, Colvilles, Limited, Glasgow. Mr. Park claimed £10,000 for fractures of his spine sustained in an accident at the firm's Clydebridge Steelworks, Cambuslang, on April 24, 1955.

The plaintiff, who gave his evidence from a wheelchair in the well of the court, said that he was engaged to remove pieces of metal which fell to the floor while the furnace was being charged. While he was doing this, he said, other employees started to charge the furnace and particles of molten metal began to fall about the place where he was standing. To escape injury he moved back and fell through a hole to the floor beneath, striking a pipe and causing the injuries to his back.

Mr. Park alleged that his employers failed in their duty to maintain a safe system by seeing that there were no unprotected openings in his place of work. The defendants denied blame for the accident and contended it was Mr. Park's own fault in not standing clear when the furnace was about to be charged.

Clean Air Act

Although previous reference has been made to the fact, the recent publication of Clean Air: The Dark Smoke (Permitted Periods) Regulations, 1958 (SI 498, 1958), makes it worth repeating that after June 1 it will be an offence to emit dark smoke from chimneys. This is smoke which is as dark as or darker than shade 2 on the Ringelmann Chart. The regulations, however, set out a number of exceptions.

These allow "10 minutes of dark smoke in eight hours (14 minutes if soot-blowing is carried out in that period) provided no single burst of dark smoke lasts longer than four minutes." If the chimney serves two furnaces, the times are extended to 18 and 25 minutes, respectively, three furnaces, 24 and 34 minutes, respectively, and four or more furnaces, 29 and 41 minutes, respectively. The emission of black smoke (Ringelmann Shade 4) for more than two minutes in the aggregate in any period of 30 minutes is not allowed.

The regulations apply to the chimneys of factories, shops, offices, and railway engines, but not to ships' funnels for which separate regulations will be made. They also apply to house chimneys, but it is not thought that they will be likely to give rise to offence under the Act.

Gases and Trade Effluent

On the same day the Alkali, etc., Works Order, 1958, is extended to include pollution by gases and fumes from a large number of works. "Noxious and offensive gases" now include compounds of ammonia, acetylene, and those containing iron, aluminium, chlorine, or their compounds. The second schedule of the Order gives a comprehensive list of the works affected by this order.

Iron and steel works are listed under five categories, copper works under two, and aluminium works under three. Electricity works are divided between those generating electricity for public use or for public transport, and others; gasworks are divided into producer gasworks and others, the latter being subdivided into four categories. Two kinds of ceramic works are specified, and the schedule also lists lime works, sulphate reduction works, caustic soda works, and chemical incineration works.

A third cause of industrial pollution—that of rivers—is the subject of the first report of the Trade Effluents sub-committee of the Central Advisory Water Committee. It is recommended that the period during which the consent of the Minister of Housing and Local Government is needed before river boards can prosecute for river pollution should be extended from 1958 to 1961.

Foundries in the East Midlands

The fifty-fifth annual conference of the Institute of British Foundrymen is to be held this year at Buxton, from May 13 to 16, and as the venue chosen is so conveniently located in relation to the foundries of the north and east Midlands the programme is to be extended by a day to permit two sets of works visits to be made. Continuing the account of the various foundries, large and small, which will be open to visiting parties during conference time, the following includes descriptions of the Derby workshops of British Railways, and a number of other concerns of varying magnitude and purpose. The series, which it is hoped will be of value to members in deciding which works they wish to visit, will conclude in a forthcoming issue of the JOURNAL, *with an account of Stanton's Ironworks Company, Limited, near Nottingham.*

(*Continued from p.* 349)

Sheepbridge Alloy Castings, Limited

Sheepbridge Alloy Castings, Limited (at Sutton-in-Ashfield), a branch of the Sheepbridge Group, was formed at the beginning of the 1939/45 war as a "shadow" factory for the production of centrifugally-cast steel components to meet the requirements of the aircraft industry. The original works covered an area of 80,000 sq. ft., but of recent years it had been enlarged to an area of 180,000 sq. ft. of productive floor space and now incorporates quite a large area for the production of commercial sand castings. With this extension has also come new products, of which probably the most outstanding is the long-length centrifugally-cast tube. The latter enables the foundry to produce castings for various industries which, in the past, were either imported or produced by more costly processes.

Within the past two years, the non-aircraft side of the works has been expanded even further and a new mechanized section has been added to accommodate machine-moulded castings for the food, dairy, brewery, chemical and petroleum industries, as due to the increased activities, it was found that the existing force of hand moulders could not meet the demands being made upon them. This foundry was also one of the first concerns to make steel shell-moulded castings a commercial proposition and it is still busily engaged in this sphere.

Range

The range of materials produced is very comprehensive, ranging from carbon steel to austenitic steels and many grades of heat-resisting alloys incorporating also "Nimocast" grades and the equivalent of many well-known proprietary heat- and wear-resisting alloys.

Also at these works is the largest production unit in this country for manufacturing die-cast and continuously-cast grey-iron and alloy-iron bars. Similarly, but obviously on a somewhat smaller scale, continuously-cast solid and hollow phosphor-bronze bars are produced. In the steel foundry, centrifugal castings can be produced up to about 42-in. dia. and in the sand foundry, castings ranging from a few ounces up to 2½ tons are in regular production. Melting units consist of two electric-arc furnaces and 12 high-frequency units of varying capacities. The most recent additions to the melting facilities (now being installed) are two vacuum units.

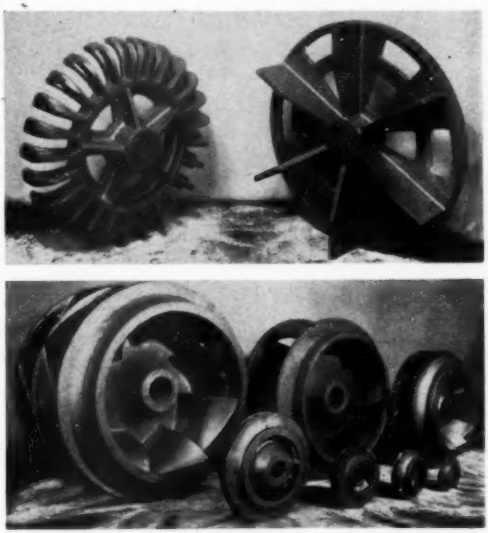


FIG. 1.—*Typical high-duty castings made by Sheepbridge Alloy Castings, Limited. The upper photograph shows a top and bottom plate for a furnace, produced in Nimocast 75 alloy and below, various types of impellers cast in 18/8 stainless steel.*

A large machine shop is attached to the foundry and has recently been equipped with all new machines, including vertical borers, combination lathes, centre lathes, etc. Where possible, castings produced in the foundries are proof machined before despatch. To implement this proving service, castings can conveniently be subjected to inspec-

FIG. 2.—*Aerial view of Bamfords, Limited, showing its extent on the south side of Uttoxeter with frontage on the main Derby to Crewe railway line.*

Courtesy, Keystone Press]

tion by X-ray, gamma-ray or various methods of crack detection.

The commercial sand-moulding foundry does not, in a strict sense, specialize in products for any particular industry, but has gone to great lengths to produce high-quality castings for water turbines and large pumps and has met with some considerable success in making all types of "Francis Runners" and large impellers in stainless steel (Fig. 1).

The works is set in pleasant country surroundings and has sufficient space to expand if at some future date this is considered necessary.

Bamfords, Limited

Bamfords, Limited, of Uttoxeter (Fig. 2), are one of the few old-established family businesses left in the agricultural engineering industry and although founded some 86 years ago, the firm is one of the most progressive in the trade. The works covers an area of 28 acres on the south side of Uttoxeter, Staffordshire, and is laid out for efficient and large production of the wide range of farm machinery and engines marketed in all parts of the world. The range of the firm's production covers balers, mowers, hay-making implements, manure spreaders, seed and fertilizer drills, diesel, petrol and vaporizing-oil engines, lighting sets, etc.

This type of production involves the supply, in large quantities, of a tremendous variety of components and to this end a well-equipped foundry covering some 120,000 sq. ft. has been long established but in it the latest methods of production are now employed. The foundry employs some 110 workers and is semi-mechanized, producing iron and non-ferrous castings up to 4-cwt. in weight. Fig. 3 shows the method of molten metal collection at the cupola.

With the ever-increasing trend of fabrication, a correspondingly large welding and blacksmith's shop has been built and the output of both the foundry and the fabrication departments is processed by the various machine shops, which are furnished with many of the latest types of automatic machine tools, performing a multitude of different operations. The various fitting and erection shops are operated on flow systems, fed with sub-assemblies, to produce the wide variety of finished machines and engines. Infra-red paint-drying plants are employed on most of the products after painting and the finished machines are shipped to many parts of the world. The firm also possess their own sawmill to deal with all the timber requirements, from the rough-tree stage onwards.

It will therefore be evident to the visiting foundrymen that the firm does not have to rely on outside sources for the majority of the components. In most cases, they are created on the spot from raw materials and hence a large number of processes are employed. The total number of employees in all departments is around 700.

Apprentice-training schemes are in operation and, on the welfare side, a well-run canteen is provided and a sports club is organized. Bamfords sports

FIG. 3.—*Molten-metal distribution from mobile receiver at the cupolas into bogie ladles, in Bamfords foundry.*

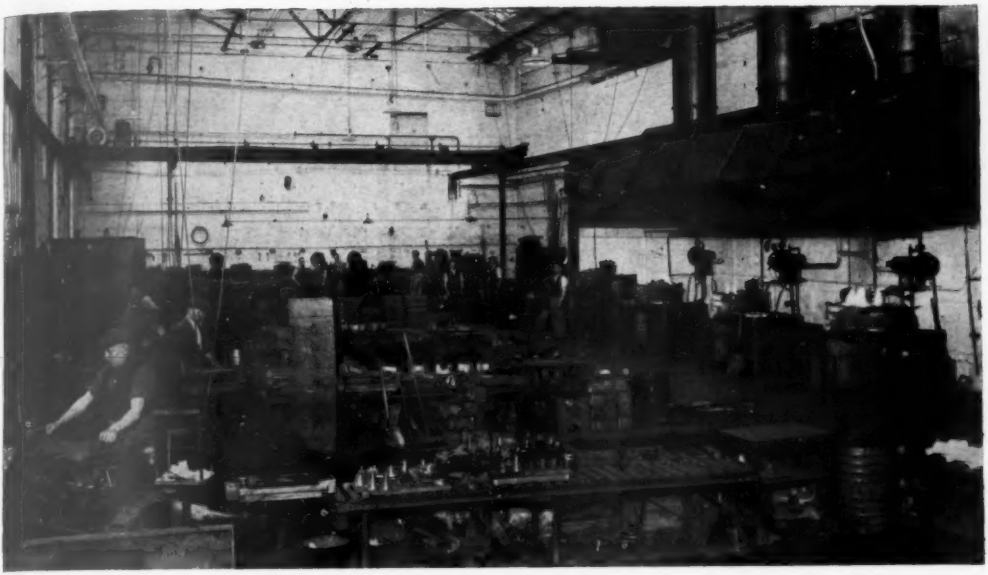


FIG. 4.—*General view of British Railways' Derby non-ferrous foundry showing moulding machines on the left- and melting equipment on the right-hand side. Note the use of short roller conveyors for coreing and closing, and well-ventilated hood over the melting equipment.*

ground is a centre for football, tennis and cricket and its amenities are so fine that for a number of years, Staffordshire have played Minor Counties cricket on this ground. A large three-storey office block is the nerve-centre of the administration of the firm, all the present directors being actively concerned with day-to-day production, organization and administration in addition to formulating and implementing policy.

British Railways' Locomotive Works

The Locomotive Works of British Railways at Derby has a staff of approximately 4,000 and covers an area of 47 acres, of which 13 acres are occupied by workshops and offices. The first workshops were built about 1840, when a joint passenger station for three companies—the Midland Counties Railway, the North Midland Railway, and the Birmingham and Derby Junction Railway—was completed. The foundries were built on their present site some time between 1866 and 1885, although a brass foundry at another position in the works was in use before 1866.

Brass Foundry

The brass foundry (Fig. 4) comprises two shops divided by the access passageway to the boiler lift. This physical separation is also a functional division—the larger shop with an area of 5,400 sq. ft. is the foundry and coremaking department and the smaller, of 4,200 sq. ft., is the fettling shop. The total number of employees in this foundry is 58, this figure being made up of 12 skilled moulders, 4 coremakers, 27 semi-skilled staff, 4 furnacemen, 4 apprentices, and 7 labourers. The foundry produces, by both hand and machine methods, brass, bronze and aluminium castings—the output for the past year being just over 800 tons. Extensive use is made of machine moulding, only the more intricate components being moulded by hand. The range of work varies from small castings of a few ounces in weight to large axleboxes which weigh ¾ cwt. In addition to details for locomotive construction, all the non-ferrous castings required by the Carriage and Wagon Works at Derby are produced in this shop. The foundry is equipped with three Morgan HLP type oil-fired crucible furnaces for melting the metal, each of 600-lb. capacity. Other equipment includes:— a Sklenar-type de-metalling furnace; four 602-type Osborn moulding machines; a MacNab jolt/squeeze moulding machine, and two core-ovens, each with a capacity of approximately 100 cub. ft., by Ballard & Company.

The sand mill, which has a capacity of 1 to 1½ tons per hr., is located in the fettling shop and other equipment of interest in this department, apart from the saws and grinding machines, is a 40- by 32-in. Sand Wizard by Constructional Engineering Company, Limited, and a shotblast cabinet by Spencer & Halstead, Limited. A portion of this smaller building is used for aluminium castings and this area contains two lift-out type Morgan crucible furnaces, each of 120-lb. capacity. Sand is stored in bunkers outside the shop and metal is kept in an adjacent building. An interesting point is that under

FIG. 5.—*Apprentices and their instructor at the training section of the BR workshops in Derby.*

the modernization scheme, production of main-line diesel locomotives in the works will replace that of steam locomotives and, because of this change, the proportion of aluminium castings is expected to increase in the near future.

Shell moulding is a method of casting production of comparatively recent introduction to these works. The machine used for this is a double-station type, supplied by Foundry Equipment, Limited, and is capable of producing 20 shells per hr. per station. Development of this process has taken place over the last two years, and the production of a number of components by this technique has now been established. One order of particular interest is for 192,000 pipe clips to be used in the conversion of wagons to continuous braking—a requirement under the modernization scheme.

Iron Foundry

The iron foundry consists of two main buildings and a smaller fettling shop. The larger of the buildings has an area of 22,500 sq. ft. and is divided into two bays. Along the wall of the first bay and leading directly into the shop are the sand-mixing house, the cupolas, three large core-ovens and the coremaking department. In this bay, general hand moulding of the large castings is carried out. There are seven moulding machines of various types and the majority of these are installed in the second bay, where a section having an overhead monorail/hoist system is laid out for the production of firebar moulds from two machines. The remainder of the machines are employed on general work and are served by roller conveyors. The two 48-in. dia. cupolas, which are used on alternate days, are each capable of an output of 150 tons of metal per week; they are fed by means of an exterior staging served by an electric lift from the bunkers of scrap, pig-iron, etc., in the foundry yard. Incorporated in the core-oven equipment is an Acme coke-fired continuous core-drying stove. This section of the foundry also has two overhead gantry cranes, one of 20 tons capacity and one of five. Some fettling is done at the end of this building and it is here that a 90-in. rotary-table Sand Wizard shotblasting machine is installed. The fettling shed is, however, a separate building, 560 sq. ft. in area, situated at the end of this main shop, and contains two 30-in. double-ended Rowland grinding machines, in addition to other equipment.

The smaller of the two main buildings has an area of 10,050 sq. ft. and was formerly used for the production of cast-iron chairs for the permanent way; it is now fully occupied in producing carriage and wagon axleboxes. Two cupolas attached to this building can give an output of 250 tons of metal per week, but they are not at present in use, the metal for this section of the foundry being obtained from the two cupolas in the larger building. The chief items of plant in this shop are:—A 5-ton-capacity overhead gantry crane; two moulding machines; three core-stripping machines; a core-oven, and an octagonal rotary drum through which the castings pass for the purpose of ridding the cavities of sand. This tumbler machine is fed by a conveyor at the end of the shop. The total number of employees in the iron foundry is 91, of whom 25 are skilled, 39 semi-skilled, 5 apprentices, and 22 labourers. The output of the foundry is almost 4,000 tons of castings per year, for both the Locomotive and the Carriage and Wagon Works at Derby, the range (by weight) of the components produced being from under 1 lb. up to such items as locomotive cylinders weighing about 3 tons. Cores are made both of sand and loam—the core-sand mixtures being based on Chelford silica sand or sand from Warsop and Mansfield; moulding sands are based on Warsop or Weatherhill sands.

General

Close metallurgical control is kept on the foundry materials by the works metallurgist in co-operation with the foundry foreman. He advises on the composition of the cupola charges and checks the metal produced by both physical and chemical testing methods. During the first 12 months of their employment, apprentices for the works departments receive their initial instruction in the Works Training School. Four months are spent on general training, during which time they pass through all sections of the School, and this is succeeded by eight months' instruction on the section for the particular trade they are to follow. The average number of apprentices who pass to the foundries to complete their apprenticeship is 10 per 60-month period. Fig. 5 shows foundry apprentices at work.

Improved handling techniques, using pallets and pallet trucks, are soon to be instituted in the foundries as part of a works modernization scheme

and this will improve the layouts and increase the effective working area.

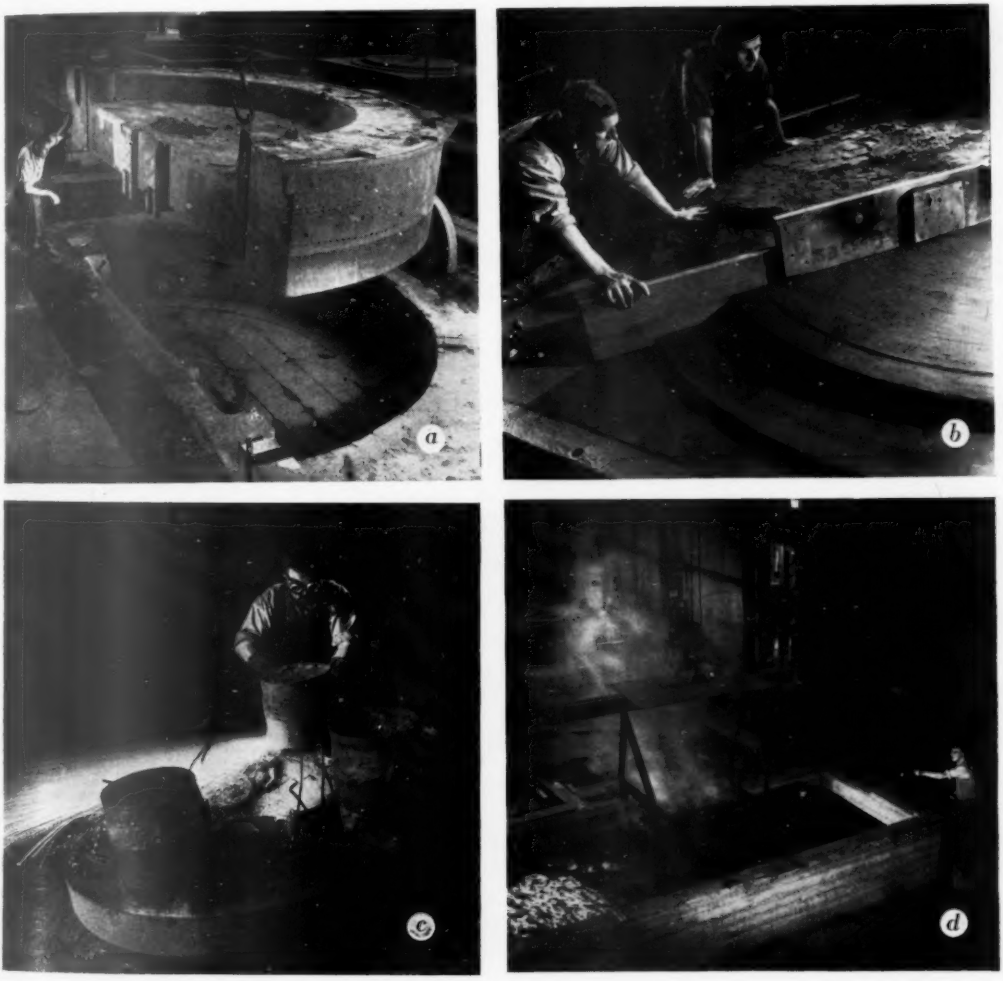
Parker Foundry (1929), Limited

Parker Foundry (1929), Limited, a member of the F. H. Lloyd group, is a modern steel foundry producing some 120 to 130 tons of carbon- and alloy-steel castings per week, in sizes ranging from a few pounds up to 10 tons in finished weight. The output from the foundry has about doubled over the past two years. A specialty is made of steel castings for the electrical industries. Some 450 personnel are employed, working a 44-hr. week; illustrations of the methods and equipment are reproduced in Figs. 1 and 2.

Foundry

The foundry is divided into the following sections:—Heavy-box and floor-moulding bay; light-box moulding bay; machine-moulding section; heavy coreshop, and light coreshop. In the heavy-box and floor-moulding bay, box- and pit-moulded castings from 5 cwt. to 10 tons in weight are produced, and this section is served by a Beardsley Piper motive-type Speedslinger. The machine-moulding section comprises four Coleman-Wallwork

FIG. 6.—*Stages of work in progress at the Parker steel foundry: (a) stripping the pattern for a large half-flywheel; (b) strickling an end-cover mould; (c) cutting off feeder-heads by oxy-acetylene, and (d) quenching a batch of small steel castings.*



jolt/squeeze pin-lift type moulding machines and one 4,000-lb. capacity Pneulec Herman rollover machine. Melting plant consists of one 5-ton Efco arc furnace and one 3½-ton Birlec furnace, both operating on a basic two-slag process. The plant is modern and fitted with all the necessary equipment to give rapid and economical melting and accurate control over the metal. Immersion pyrometers are used to measure the temperature at the various stages (of the heat) and the temperature is indicated and recorded on an instrument (by Honeywell Brown) on the furnace-control panel. Both furnaces have rammed Dolomite linings and silica-brick roofs. The melting bay is adequately ventilated but in addition, each furnace is equipped with fume-extraction plant of large capacity, the Efco rate being 17,500 cfm. and the Birlec 16,000 cfm. Oxygen is laid on for practising oxygen injection during the oxidizing stages of the heat. The furnaces are fitted with a swing-roof, enabling drop-bottom charging buckets to be used, and these are loaded by the magnet. A furnace stage laboratory is equipped for the sampling of both furnaces and also houses a Carbometer, used for rapid determination of the carbon content of the molten metal.

Coreshops

In the heavy coreshop are three corestoves, two of 12 by 7 by 6-ft. 6-in., and one of 12 by 8 by 6-ft. 6-in. Two are of bogie-type and the third takes stillages moved in and out by lift truck. Heavy cores from both machines and the hand-coremaking section are delivered on roller conveyors to the store area. Stacking racks are used on corestove bogies and can be transferred in this way to the moulding stations. In the light coreshop, benches are arranged on either side of a steel-band conveyor taking "green" cores to two vertical continuous drying stoves ("Acme Junior"). Both these stoves are gas fired and thermostatically controlled and chart recorders are fitted. Two small turn-over machines are installed for producing repetitive cores accurately.

General

The main static plant in the heat-treatment department comprises two gas-fired heat-treatment furnaces one by Incandescent and the other by Gibbons and a 6,000-gall. concrete quenching tank. In the light fettling shop, a dual-table, 7-ft. 6-in. dia. Wheelabrator shot-cleaning plant is in use, plus a 48-in. Tumblast barrel plant to cope with light to medium weight castings. In the heavy fettling shop, a 10-ft. dia. Spencer Halstead rotary-table room-type Centriblast shotblast plant is installed; this employs three impeller wheels and air-shot pressure "spotting" gun to clean effectively any deep pockets in castings. On the mechanical-handling side, visitors will be impressed by the very extensive and skilled use made of overhead cranes. A large patternshop is well equipped with machinery, including a large Wadkin Universal Miller, thicknesser, etc.

In order to produce castings of the highest possible quality, particular attention is paid at Parker Foundry to high-grade control and technical staff are employed in the following departments, which are all well-equipped with modern apparatus: chemical laboratory, furnace laboratory, sand laboratory, physical test-house, and non-destructive testing section. In the latter, gamma radiography is used, giving penetration of up to a maximum of 4-in. thickness of steel. There is works canteen which seats some 130 people, a staff canteen and an executives' dining room. Full washing and shower-bath facilities, installed about seven years ago (*i.e.*, before the Iron & Steel Foundries Regulations) are available.

Qualcast, Limited

The company originated from a business started in Sheffield in 1801 by the great-grandfather of Mr. J. E. V. Jobson, the present chairman and managing director, who represents the fourth generation of his family to have been at the head of the firm. First established at Derby in 1849, the firm traded under the name of Derwent Foundry and specialized in the manufacture of high-grade castings needed for countless purposes during the expansion of British industry in the second half of the last century. In 1928, the name was changed to Qualcast, Limited, and it was converted into a public company.

Qualcast now has ten operating subsidiaries in this country. The group's main works are at Derby (these are to be visited by the foundrymen) and there are also works in London, Wolverhampton, Manchester, Leicester, Stoke-on-Trent, and Stowmarket. In addition, there is a wholly-owned subsidiary in Australia.

The group's principal activities are lawn-mower manufacture and repetition ironfounding. In the first case, they are the largest manufacturers of lawn mowers in the world, producing well over 80 per cent. of the total UK output for both home and export markets. In the latter field of ironfounding, the group claims to be one of the largest of its type in Europe, having seven foundries within the organization supplying a great variety of industries, including automobile industry, refrigeration industry, electrical trades, machine-tool, domestic-appliance, textile, and general engineering trades.

Foundries

In addition to a normal sand-cast foundry at Derby, the group operates a specialized process (for which it holds the exclusive rights for the UK and various overseas territories) for the production of iron castings from permanent moulds. This ferrous die-cast foundry, as it is termed, is fully mechanized, being equipped with 17 permanent-mould machines; it is a highly-developed method of casting which produces parts on a large

repetition scale for practically every trade where iron castings are used. Last year, some 25,000,000 castings were produced by the process. Annealing of castings after casting is necessary and this is done on the premises—five annealing ovens being in constant use. The grey-iron foundry at Derby is mainly for repetition machine moulding, and incorporates normal hand- and power-operated moulding machines.

The Qualcast steel division at Derby produces a special heat-resisting and abrasive-resisting steel, the composition of which is designed to give a metal which will withstand high temperatures and has been found to be particularly suitable for a large variety of trades, including railway locomotives, heat-storage types of cookers, furnace equipment, as well as brickmaking machinery, etc.

Plant

Hot-blast cupolas are used for producing special iron for the die-cast foundry, while ordinary cold-blast cupolas are installed in the grey-iron foundry. The steel foundry has two furnaces, a "Stobie" type, of 30-cwt. capacity, and an "Efco" furnace holding 3 tons.

An efficient metallurgical staff, working in a modern, fully-equipped laboratory, ensures rigid quality control of all materials used and castings despatched. In addition to the routine day-to-day checking, chemists carry out research and experimental work in the search for new and better alloys and processes.

The Derby works covers some 14 acres and has a payroll of over 2,000 employees, of which approximately 50 per cent. are skilled and semi-skilled workers. There is an apprentice scheme in operation, whereby personnel of school-leaving age can be trained throughout the various departments of the firm's organization.

Amenities

At the Derby works there is an efficient surgery, with a fully-qualified nursing staff and medical attention and advice is given by the works doctor. On the social side, there is an excellent sports club, for all kinds of sport and recreational activities throughout the summer and winter months. The sports ground comprises 12½ acres, where a new pavilion and clubhouse has recently been completed.

Rolls-Royce, Limited

Rolls-Royce, Limited, was founded in 1906 for the manufacture of the motor cars which have since gained such a world-wide reputation for excellence that the title is now a synonym for the highest quality. Then, in 1914, Sir Henry Royce began the design of his first aero engine, the 12-cylinder "Eagle," and between the wars, Rolls-Royce aero engines made important contributions to aviation history. Most notable of these were the first direct crossing of the Atlantic by the Eagle-engined Vickers Vimy in 1919 and the winning of the Schneider Trophy outright by the Rolls-Royce "R" engined Supermarine S.6B in 1931. During the second world war, the company produced the only jet engines to see active service on the allied side, and after the war, played an important part in the re-equipping of many air forces with jet-engined models. The company entered the field of civil aviation after the war and their "Dart," which powers the Vickers "Viscount," was for nearly four years the only gas-turbine in airline service in the world. To-day, more than half the gas-turbine-powered airliners which are in service or on order in the western world have Rolls-Royce engines. The 42,000 people now employed by the company are engaged on the manufacture of diesel engines, rocket motors and nuclear propulsion, as well as aero engines and motor cars.

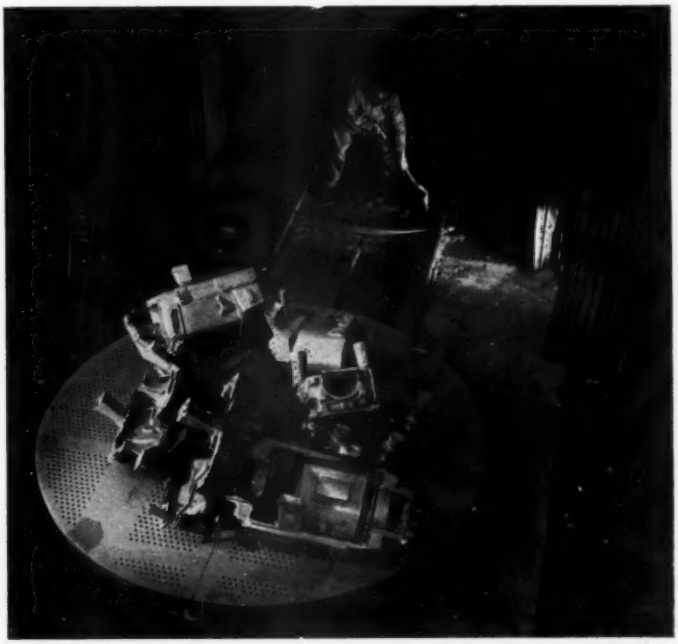


FIG. 7.—*One of the large rotary-table shotblast plants at Parker Foundry. The load on the table indicates the intricate nature of some of the steel castings produced.*

FIG. 8.—*Section of Rolls-Royce precision-investment foundry, showing the plant for making wax impressions.*

The firm's foundries at Derby occupy some ten acres and as a unit they are comprehensive and self-contained, with their own drawing office, patternshop, tool-room, laboratories and dressing department. As much as 80 per cent. of the company's aero-engine division's foundry requirements are produced on the site, including all experimental work. More experimental work and a small quantity of production work is undertaken also for the oil-engine and car divisions, but the total of castings needed by all divisions is such that much production work is sub-contracted. Thus the foundries at Derby should be regarded in the light of their adaptability to experimentation and development of existing castings; rarely is "long run" work undertaken. In turn, this means that there is a high proportion of skilled craftsmen although, of course, large sand-handling and moulding machines are much in evidence in all the company's foundries. Products vary in weight from light-alloy castings of a few ounces to 3-ton iron castings.

A stringent inspection system is applied in the foundries no less extensively than in the company's machine shops. All castings are chalk or "Ardox" tested in case of near-surface defects; deeper flaws are revealed by X-rays to which all large castings and a proportion of the small castings are subjected before being machined.

Foundry Sub-division

There are four main foundries—for aluminium, magnesium, iron and the lost-wax (Austenal) process (Fig. 8). A smaller development foundry, which possesses high-frequency furnaces and a 30-lb. radio-frequency melting unit, is engaged in improving precision and semi-precision methods of manufacture and in developing refractory materials for moulding. The Austenal foundry produces precision investment castings in high-alloy steels and Nimonic alloys. The main output is of nozzle guide-vanes—small aerofoil blades, subjected to high temperatures in service, which direct the gas flow through the turbines. The visitors, however, will be quite familiar with the statuette "Spirit of Ecstasy," the graceful lady adorning Rolls-Royce car radiators and which is now fashioned by this process. In contrast to the generally-accepted method of precision-investment casting using an ethyl-silicate-bonded investment, the Austenal process originally uses a slurry containing ground firebrick.

Since the larger castings for the gas-turbine engine work are made of aluminium and magnesium alloys, iron casting is less prominent in the Rolls-Royce foundries than heretofore, though there is still a large number of special jigs and fixtures made here, not to mention castings for the firm's car and oil-engine divisions. A feature of the magnesium foundry practice is, of course, the extensive use of inhibitors, such as sulphur and boric acid in the sand.

Individual bays are laid out in the aluminium foundry for separate types of casting and the necessary heat-treatment facilities are at hand. Each

foundry employs the carbon-dioxide process where appropriate for coremaking and has its own fettling shop.

The frequency and diversity of new schemes undertaken at Derby keep the patternshop fully occupied, whether it be working in metal, mahogany or epoxy resin. Many of the patterns are very complex, *e.g.*, that for the "Dart" air-intake casing uses as many as 40 cores. Dies for the Austenal foundry are made in the company's tool-room, where intricate machining techniques are of more than usual interest. There is an electronic comparator in the adjacent inspection department.

Omission. In the map of Buxton printed in last week's issue as a guide to intending participants in the IBF Conference the location of the Savoy Hotel was unfortunately not marked although listed in the caption. The hotel is situate on Hall Bank quite close to the Town Hall.

Progress of Technical Education

Sir Edward Boyle, Parliamentary Secretary to the Ministry of Education, speaking in Sheffield said that a considerable advance was being made along the lines of the policy for technical education adopted by the Government. In the universities the number of students in science and technology departments since the war had been increased by about 154 and 134 per cent. respectively. The actual numbers in those departments had recently increased from 29,000 in 1955-56 to 35,000 in the current session. The plan was to increase this total to 55,000 in the mid-1960's He went on to say that, since the White Paper was published, full-time students in the technical colleges had increased from 63,000 to 76,000, and of these the number of sandwich course students had gone up from 1,500 to 4,000. About 1,400 students were now in courses leading to the new diploma in technology. These figures were the result of an improving partnership between technical colleges and industry. In conclusion he said that many firms were now training as many apprentices as they could handle, but a further big step forward depended on the firms who did not now have a training programme.

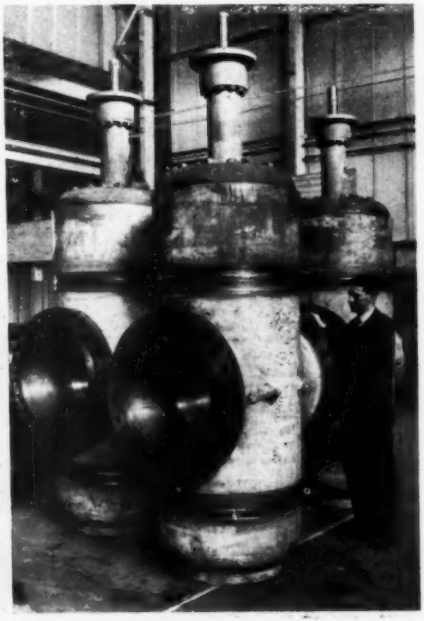
Valve Manufacturing Project

Oil-pipeline valves of a size and type previously manufactured only in the USA are currently being made by the David Brown Foundries Division, Penistone, to the order of the W.K.M. Valve Company (Britain), Limited. The valves (Figs. 1 and 2) are intended for use by the Shell Petroleum Company in Venezuela. Although the company has had many years' experience in the production of steel castings for oilfield and refinery use, the manufacture of complete valves is an important new venture which has particular significance from the dollar-earning point of view.

Three sizes of valve have so far been produced, with bore diameters of 16, 24, and 30 in., respectively. Cast in carbon steel the valve bodies are moulded in three sections. Largest of the assembled valves is approximately 10-ft. high and weighs more than 8 tons. Submerged arc welding is used to join the main body castings, which are required to withstand pressures up to 1.0-1.1 tons per sq. in. Non-destructive tests are applied to the valve body castings, and the welded joints are tested by radiographic inspection.

Inside each valve a split gate comprises a gate and segment sliding in a "V" groove. The gate and segment sections are cast in molybdenum steel, and the seating is of stainless steel. These components are ground to limits of 0.002 in. and are chromium plated.

FIGS. 1 AND 2.—*Large valves cast in molybdenum steel by David Brown Foundries; Fig.* 1, *hydraulic pressure test being applied to a valve, and Fig.* 2, *group of* 24-*in. valves ready for despatch.*



Equipment and Supplies

Plastics/Metal Composition

A material comprising about 80 per cent. of a steel or other metal, and 20 per cent. plastic, brought out by the Chemical Development Corporation of America, is now available in the United Kingdom. The trade name of this type of material is "Devcon" and the sole concessionaires in this country are E. P. Barrus, Limited, 12-16, Brunel Road, London, W.3. A wide range of application is claimed for it—for making tools, jigs, fixtures and dies, for repairs and for filling holes in castings. Of putty-like consistency it will adhere to steel, aluminium, bronze, brass and cast iron. Four formulations are available, A, B, C and F. The second of these is a liquid and can be poured. "Devcon" C is claimed to be heat-resistant and the last mentioned of these four materials is described as an "aluminium putty" (80 per cent. aluminium and 20 per cent. plastic). Specific uses in the foundry are stated to be for the repair and alteration of wood and metal patterns and coreboxes, the building up, repair and alteration of gates, for making patterns, coreboxes, models, pattern duplicates and blow boxes, mould shells or driers.

The material, it is claimed, can be stored for a year without hardening taking place, and when, with the addition of a hardening agent, it is allowed to set, it becomes, apparently, a metallic substance which can be drilled or tapped with metal-working tools. Patterns (Fig. 1) made from the material have, it is stated, the advantage that they are not affected by atmospheric or temperature changes and so will not warp or shrink.

In foundry activities, saving of cost and time are claimed, as for example in the production of a duplicate pattern in three hours by means of the liquid formulation; high abrasion-resistance is also claimed.

BRUMMER, LIMITED, of Oyster Lane, Byfleet, Surrey, are marketing a "stopping" which, it is claimed, adheres to iron and does not chip off once it is set. It is used for filling blowholes, and is also being used with success for filleting, especially by pattern-makers. The producers emphasize that the material is not a plastic.

TWIFLEX COUPLINGS, LIMITED, a subsidiary of Sheepbridge Engineering, Limited, of Chesterfield, announce the addition of disc brakes (incorporating Dunlop disc-brake operating units), to their range of power transmission equipment, for all types of heavy industrial applications.

PANORAMA EQUIPMENT, LIMITED, 29/36, Seymour Mews, Wigmore Street, London, W.1, have introduced an industrial safety helmet. Bearing a kite mark under Licence 2820, to British Standards Specification 2826:1957. It carries the trade name of "Lifeguard."

ALBION MOTORS, LIMITED, of South Street, Scotstoun, Glasgow, W.4, have introduced an end-tipping chassis, based on the forward-controlled rigid eight-wheeled Caledonian model. Designated 24C/3T, the new tipper has a mean wheelbase of 14 ft. 9 in. and is suitable for a body with internal dimensions of 17 ft. 9 in. long by 7 ft. 6 in. wide. The chassis with the cab weighs 126 cwt. which, when deducted from its gross rating of 24 tons, leaves 15¼ tons for payload and 2¼ tons for body, tipping gear and equipment. The new model has a five-speed gearbox, two steerable front axles, and two driven rear axles in bogie form and is powered by the 125 h.p. Leyland diesel engine.

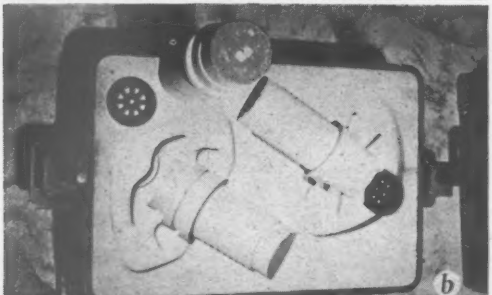


FIG. 1.—*Foundry applications of Devcon:* (a) *Production of pattern duplicates from original wood patterns;* (b) *shows a close-up of one half of a sand mould formed using patterns of the material and also sand cores (one core is in position in the mould, the other is standing vertically);* (c) *illustrates a set of aluminium coreboxes in which it was necessary to provide guide pins. The thin wall-section of the underside of these boxes did not provide sufficient body to allow the pins to be placed firmly. The simple expedient of building up three of the corners with the new material, and then drilling the guide-pin holes, accomplished this job in a matter of minutes.*

South African Foundrymen celebrate 21st Anniversary

Summary of Proceedings from the Journal's Special Contributor in South Africa

In February the South African branch of the Institute of British Foundrymen celebrated its 21st anniversary, and to mark this "coming of age" the branch staged a very successful exhibition; concurrently with this there were twice-weekly film shows of both technical and general interest. A one-day conference was also arranged and a fitting climax to the three-week period of celebration was the anniversary banquet held at the Langham Hotel, Johannesburg. The proceedings were publicized both over the radio and in the (SA) national and technical Press and, in addition, the publishers of the Engineer and Foundryman *issued a special 68-page supplement containing the technical papers presented at the conference and other items of interest in connection with the South African branch and the foundry industry of that country. The following is a special report, contributed from South Africa, on the various events and concludes with a brief history of the formation of the South African branch.*

EXHIBITION OPENING

The foundry exhibition, staged in the foyer of the Johannesburg Public Library, was opened by Dr. C. M. Kruger, general manager of the SA Iron and Steel Industrial Corporation, Limited, Pretoria, on February 3.

In the course of his address, Dr. Kruger said that "in modern industrial development it had become generally recognized that the sharing of what in former times had been called 'trade secrets' and 'arts' was not only practical but desirable. It had been established that the free exchange of information between competitors in the same or similar lines of business had the good effect of placing everybody in that industry on his toes and thus increasing the competitive spirit to the benefit, in the long run, of all. To encourage developments in industry, he said, associations and committees had been called into being for the purpose of exchanging and sharing in 'Know How' and techniques.

"In the foundry industry in South Africa," he commented, "we are fortunate in having a South African branch of a very old and progressive organization, the Institute of British Foundrymen, which body is responsible for arranging meetings between foundrymen where mutual problems can be discussed and these discussions made known to those interested. This body is also responsible for the application of results of scientific research." He concluded by saying "the committee responsible for staging this exhibition is to be congratulated, and it is hoped that this fine display of the work of our foundries is the forerunner of further exhibitions in the future. I hope that the work of the South African branch will continue to prosper, thus assisting in making South Africa progressively less dependent on overseas sources for supplies of specialized items."

First of Its Kind

The foundry exhibition, the first ever to be held in South Africa, was open from February 3 to 23. There were several thousand visitors during this period; it has in fact been ascertained that 2,000 passed through the foyer daily.

An original feature, which formed the background to the exhibition, was a large tree bearing the caption "The Foundry Industry—and You!" To depict the way in which the foundry serves the people in everyday life, the roots were shown as raw materials (sand, pig-iron, etc.); the trunk listed the personnel involved, from the labourers to the technicians; the branches represented the industries served from the "arts" to agriculture, while the fruit was symbolically shown as the end products. A number of exhibits were displayed in 12 showcases and these included patternmaking materials; patterns and moulds; moulding materials; items demonstrating moulding methods; metallurgical materials (ferrous and non-ferrous); artistic and domestic castings, castings used in everyday life and die-castings.

One of the showcases contained a typical lay-out of an iron foundry. The basis for this was a set of model roller conveyors and moulding machines supplied by the British Moulding Machine Company; Mr. S. Jane, the branch treasurer, prepared the lay-out, adding miniature moulding boxes, cupola, sand handling plant, etc. A fully-equipped fettling shop was also included and the entire model was animated with plasticine figures made by Master Alistair Goynes.

Several exhibits embodying castings in a major or minor degree were shown, including a locally-manufactured knitting machine, sewing-machine stand and cast-iron combustion stove. The exhibit which created most interest, however, was a skeleton named *Homo Vitallium* which was repaired using a wide variety of cast surgical and dental appliances. A large number of photographs were also displayed to further indicate the wide range of castings produced in South Africa. The exhibition was sponsored by the SA branch under the direction of Mr. John Steele, branch secretary, and the exhibits were kindly loaned by a good cross-section of the foundry industry.

ANNIVERSARY CONFERENCE

The one-day conference, the first to be held by the South African branch, took place in a lecture room of the Johannesburg Public Library on

South African Foundrymen's Celebrations

February 5. Altogether six papers were presented of which brief summaries follow:—

The first—"Historical Development of the South African Foundry Industry with Particular Reference to the last Twenty-one Years"—was prepared and presented by Dr. H. J. Van Eck,* the third president of the branch, and now chairman of the Industrial Development Corporation of South Africa. The Author dealt briefly with his own career and provided a background to his paper by summarizing the early developments of the South African industry. He referred to the "Official Blue Book for the Cape of Good Hope" for the period 1830-40, which, he said, mentioned a few industries including a foundry, presumably the Cape Foundry which, in 1831, was already advertising a number of products such as church and yard bells, cast-iron railings, and bushes for carts and wagons. He went on to say that the Phoenix Foundry of 1836 existed for only a short period but later others, for example the foundry established by Mr. Prestwich in 1840, were more successful. He said the biggest handicap of the South African foundry industry was, in his view, its complete dependence on imported raw materials, including coke.

The first world war had put the young foundry industry to its first severe test but the challenge brought further expansion in size and scope, a fact which emphasized the extreme shortage of pig-iron. The result was that three blast furnaces had been started almost simultaneously between 1918 and 1921. The second blast furnace of the S. A. Iron and Steel Industrial Corporation was blown in during November, 1936, and this event preceded, by a few weeks, the formation of the South African branch of the IBF. The Author then gave a comprehensive review of the foundry industry from its early beginnings to its present-day status.

The second paper was presented by Mr. W. W. Braidwood of the Mond Nickel Company, Limited, London, and was entitled "Metallurgical Progress in the Iron Foundry over the Last Twenty-one Years." The Author introduced his lecture by commenting on the fact that when the South African branch was founded, the British Standard Specification applicable to production and supply of castings in grey iron, required minimum tensile strengths of 9 and 11 tons per sq. in. In fact, however, the better properties then being obtained in foundries of good status were sufficiently established for the preparation of a new specification and this was issued in 1938 as British Standard No. 786. It covered three grades of high-duty cast iron, with minimum tensile strengths of 14, 17 and 20 tons per sq. in. Mr. Braidwood went on to deal with cupola developments, and other melting units for cast iron, concluding with details of development in the malleable cast iron field and s.-g. cast iron.

Following presentation of this paper, members of the Council, past-presidents and authors of conference papers attended a luncheon given by Mr. Lawrence H. Tearle, publisher of the S.A. branch official journal, *Engineer & Foundryman*. By a fortunate coincidence, Dr. C. J. Dadswell was present in Johannesburg for a few days and was able to attend this function.

Afternoon Session

The afternoon session commenced with a paper entitled "Patternmaking—Some Observations on its Basic Principles" by Mr. J. A. de Kiewiet. Engineering patternmaking as a specialized branch of industry, the Author said, was of comparatively recent origin, and was a development of the early millwrights who were a body of skilled and versatile men, capable of making their own patterns, their own castings, and finishing their products with hand tools and mechanical aids and appliances of their own construction.

Previous to this and before the Industrial Revolution, people were making bronze and iron castings in the form of implements, columns, bells, doors, statuary, ornamentation and the like, for which patterns had to be made. In these early days, materials such as wood, gypsum, clay, etc., were made use of in the construction of their patterns or models. He said that one could not but admire the skill and ingenuity of these early and inspired artists who were perhaps the forerunners of the utilitarian patternmakers and foundrymen of to-day.

The Author then dealt with the machine-tools used in the patternshop, the setting out of a pattern, the raw materials used, and concluded by suggesting that any ambitious young man starting an engineering career as an apprentice at the bottom rung of the patternmaking ladder, could climb to great heights and achieve great success in the field of engineering. From personal experience he could name patternmakers who had advanced from apprenticeship through foremanship to become foundry managers, engineers, designers, production planners, and owners of large and small industrial and commercial undertakings.

Two papers on training were presented—"Practical Training of Apprentices" by Mr. V. F. Williams and "Technical Training of Apprentices" by Mr. G. Annandale. Mr. V. F. Williams in his paper outlined the training given to apprentice moulders in the South African railways and criticized the South African method of four years apprenticeship with a trade test at the end of that period which, if passed, enabled the successful candidate to qualify for wages of a journeyman.

Both Authors deplored the local system of compulsory attendance at technical classes and a past-president of the Institute of South African Mechanical Engineers was quoted as saying, in part of his presidential address referring to the low percentage of passes at technical colleges, that unless a change of heart among apprentices was by some means brought about, there could not be a great expectation of technicians from the ranks of the artisan classes. Indeed, with the increasing absence of pride of craftsmanship, one viewed with some misgiving the quality of apprentice whom one

* An extended summary of Dr. Van Eck's paper on the last twenty-one years' history of founding in South Africa is shortly to be printed in the JOURNAL.

might have to employ in the near future. After somewhat more than a quarter-of-a-century of experience of compulsory evening classes for apprentices, it was obvious to him that the system did not yield very satisfactory results.

"Hence it is suggested," he had said, "that attendance at 'night school' as it is popularly termed, should be optional and that bonus payments be made to those apprentices who achieve success in their examinations or are diligent in their studies. We could reasonably expect an improvement in the standard of learning with the blight of the unco-operative apprentices removed from the classrooms."

The final paper of the day, presented by Mr. J. G. H. Loubser, dealt with the "Moulding of Castings for Railway Rolling Stock." Some interesting facts revealed in this paper were that approximately 35 to 40 per cent. of the total weight of a modern steam locomotive and from 16 to 20 per cent. of the weight of the standard-type wagons consist of cast components, *i.e.* ferrous, non-ferrous and steel. Also that on an average, there are approximately 205 steel, 320 iron and 540 bronze castings items on a modern locomotive, whilst a standard open bogie-wagon has 134 steel, 26 iron and 14 bronze castings.

Briefly, casting-type selection in railway engineering, the Author said, was based on the following broad divisions in purpose—(*a*) for bronze castings for bearing surfaces, boilermounts and vacuum brake and steam valves and (*b*) for iron castings for items subjected to relatively low stressing in service and/or where the good frictional properties of s.-g. iron were desired and its resistance to heat and/or corrosion could be applied with advantage. In the field of steel castings the railway designer had wide scope, since railway equipment was subjected to more rough usage over its long life span than almost any other equipment. Hence the steel casting—with its good resistance to shock, its properties of high strength and resistance to fatigue in conjunction with toughness, and its good anti-corrosive properties—was the ideal material for highly-stressed components.

The monthly productive capacity of the various railway foundries today, he said, was approximately 5,000 tons of cast iron, 750 tons of various bronze and brass alloys and 900 tons of steel castings.

ANNIVERSARY BANQUET

The twenty-first anniversary banquet of the South African branch, held at the Langham Hotel, on February 21, was commented upon as one of the best of its kind held in Johannesburg. The principal guests were the Mayor and Mayoress of Johannesburg—making the occasion the first at which civic acknowledgment had been given to the branch—and altogether some 200 guests, members and ladies attended.

The toast to the Institute was proposed by Mr. Lawrence H. Tearle, publisher of the official Journal of the branch, *Engineer & Foundryman*. Mr. Tearle discussed, in particular, the part played by the South African branch, together with the engineering industry, in creating the opportunity of absorbing labour in South Africa, and concluded his address by stating he had been fortunate in mixing personally with the men responsible for the S.A. branch of the Institute, and on this score he could only say that having met them and associated with them, it was no wonder to him that the Institute was a great success.

The branch president, Mr. S. Pienaar, who presided over the gathering, replied to the toast by thanking Mr. Tearle for the generous support and publicity given to the branch by his journal over the past 21 years. The president then briefly outlined the history of the South African branch, and urged that it should make a greater effort to associate itself with the educational bodies in South Africa and so ensure that there would be an adequate influx of the right type of man required for the industry's future expansion.

Mr. D. Lion-Cachet, a foundation member and past-president of the branch, proposed the toast to the guests, and made particular reference to the fact that this function was the first in the history of the branch at which ladies had been present. He then commented in his usual humorous style on the trials and tribulations of foundrywork. Professor J. Willemse, president of the Geological Society of South Africa, replied to the toast proposed by Mr. Cachet.

Dr. H. J. van Eck, another branch past-president and chairman of the Industrial Development Corporation of South Africa, spoke briefly on the importance of castings in everyday life, and the evening was rounded off by a hearty vote of thanks proposed by Mr. Jack Tonge, honorary member and past-president of the branch.

BACKGROUND TO THE S.A. BRANCH

The celebration by the S.A. branch of its 21st anniversary makes the following brief account of the origin and development of the branch an appropriate conclusion to this report of the recent exhibition and conference. The commencement of organization took place in September 1936 when the *Engineer & Foundryman* (later appointed official journal of the S.A. branch), drew attention to an offer made by the Institute of British Foundrymen in response to a letter from South African foundrymen seeking advice as to the setting up of an Institute. Following a visit to England by Mr. A. H. Guy, when he came in close touch with the IBF, the question of an S.A. branch was discussed by a few leading foundrymen at a dinner in the Country Club, as guests of Mr. Guy on December 3, 1936. This meeting resolved itself into an S.A. branch of the IBF and one of the members, Mr. T. Nimmo Dewar, was appointed president.

The first branch meeting was held in Johannesburg on March 10 the following year when 30 foundrymen attended to hear the presidential address by Mr. Dewar who reviewed the growth and present-day status of the foundry industry in the Transvaal.

At the outbreak of war, the branch had a total

South African Foundrymen's Celebrations

membership of 95, and meetings were held regularly during hostilities although, in fact, only one paper was presented which had any bearing on the situation. This was entitled "Some Jobbing Foundry Wartime Experiences," and was prepared by Mr. V. K. Rice in 1942. At the conclusion of the war, another paper entitled "Some Army Foundry Experiences," was presented by Major J. Robertson.

Mr. H. Holdsworth, who is still an active member of the branch, concluded his year of office in 1946 by announcing that the branch membership stood at 238, and during his year of office, a start had been made on the establishment of a foundry sands research organization. The branch's first short paper competition was held in July, 1948, when six papers were read and the winning paper, adjudicated by ballot, was "One Method of Moulding and Casting a Five-ton Ingot Mould" by Mr. John Steele.

More Recent Activities

At the annual dinner in 1950, the announcement of a new award was made. This award, known as the A. H. Guy Medal, was to be presented to the member who, in the opinion of the Council, had rendered meritorious service to the branch or industry. The first medal, cast in gold, was presented to Mr. J. Tonge, a foundation member of the branch. At this same meeting it was announced that the membership stood at 279, but this included the figures from the Cape Town section, which was formed in 1943. Other awards which had been established by the branch at this time included a certificate of commendation to the member who presented the best paper during the year, and book prizes were awarded to candidates obtaining the highest marks in the subjects of patternmaking and moulding in the National Technical Certificate examinations. An additional award was made in 1954 in the form of a book prize annually to the student obtaining the highest marks in metallurgy in the National Technical Certificate examinations.

The formation of a sub-committee to investigate foundry sands was anounced at the annual general meeting in 1954. The purpose of this committee was to consider the establishment of some form of research on local sand deposits. During this same year the Cape Town section was formally disbanded due to lack of interest by foundrymen in that area.

At the annual general meeting in June, 1956, the retiring president, Mr. J. A. de Kiewiet, announced that, for the first time in the history of the S.A. branch, the Oliver Stubbs gold medal had been awarded to a South African member of the Institute. He then presented the medal to Mr. John Steele, at the same time announcing that Mr. Steele would take over the office of honorary branch secretary. Since the inception of the branch, this office had been held by the secretarial staff of the Steel & Engineering Industries Federation of South Africa, under the guidance of Mr. F. C. Williams, who was the first secretary of the branch.

Since the annual general meeting in June, 1956, the total number of new applications for membership in various grades is only three short of a hundred and all but three of the applications have been passed by the Institute Council. Unfortunately, in 1957, 43 names were removed from the branch roll, leaving a total at that date of 290. In addition there were 23 transfers to higher grades and six transfers from overseas branches.

The third branch syllabus was published in January, 1958, and contained details of branch activities for the ensuing six months. On January 31, the branch Foundry Sands Research Committee under the chairmanship of Mr. G. F. Alexander handed over to the Council for Scientific and Industrial Research, the results of their efforts to establish a foundry-sands research Fellowship. The purpose of the Fellowship will be to determine the availability and suitability of South African sands for foundry practice.

The initial project is for a period of three years and more than £7,500 has been raised for this purpose. This sum is £2,250 in excess of the sum for which an appeal was launched just over a year ago by Mr. Alexander who mentioned the project in his valedictory address on his retirement as branch president. Mr. Alexander has also donated a capital sum for the establishment of an annual award to be known as the Alexander medal and prize. The first award, to be made at the annual general meeting of the branch this year, will be based on the results of a short paper competition now being arranged within the branch.

Thus it can be seen that the work of the S.A. branch continues to flourish under the continuous guidance of the Institute head office and a succession of hard-working and enthusiastic branch presidents, ably supported by the past-presidents and Council members. Special tribute is due to Mr. S. Pienaar, the current branch president, for his untiring efforts to ensure that this, the branch's "Coming of Age," was suitably celebrated.

Refractory Bricks. In Publication No. 82, General Refractories, Limited, Genefax House, Sheffield, 10, cover a new range of high-temperature bricks, to which the trade name "Sillmax" has been given. This brick is based on a mineral similar in properties and character to sillimanite. There are five types in the range and, of these, Sillmax 75—based on corundum and sillimanite—is designated as the one for the most severe conditions, carrying as it does a refractoriness value higher than 1,830 deg. C. The compositions and physical properties of each type are set out as a table, and there are a number of interesting diagrams showing the positions of the refractory bricks in various types of furnaces where high duty is required.

Sinter Plant for Workington Iron & Steel

Mr. T. S. Kilpatrick, a director and general manager of the Workington Iron & Steel Company (branch of the United Steel Companies, Limited), announced recently that a completely new sinter plant and stockyard for fine ores is to be built at Workington at a cost of £2,500,000. It will take the place of the existing plant built in 1938 and will take two and a half years to build.

A record low figure in the consumption of coke needed in the making of hematite pig-iron has been reported by the Workington Iron & Steel Company. During a recent four-week period, coke consumption averaged 16.91 cwt. per ton of hematite.

Patron Saints of the Foundry Industry: Part 1, England*

By L. Faulkner

It is well known that in the Middle Ages every craft had its appropriate patron saint, whose festival was celebrated in the church, in feasting and with general rejoicing. With the decline, however, of the influence of the Church in the working life of the community and of vast and rapid industrial development, saints' days are no longer celebrated and in many trades are entirely forgotten. Even where remembered, it is as an interesting relic of olden times, no longer bearing any religious significance. In this country the patron saint of the founders and also of the blacksmiths is St. Clement of Rome, whose feast day is November 23. His history in brief is that he was a Roman of the first century, converted to Christianity possibly by St. Paul. He accompanied St. Paul on some of his journeys and was so successful a missionary that he seriously undermined the authority of the Roman masters. The envoy of the Emperor Trajan in the Crimea thereupon cast him into the Black Sea with an anchor tied round his neck and legend has it that at each anniversary the waters divided to reveal a marble shrine in which lay his body. His relics are now at rest in the basilica of St. Clement in Rome, whilst the church of St. Clement Danes in London perpetuates his martyrdom by drowning by the inclusion of an anchor in much of its insignia.

Metallurgical Origin

His claim to patronage by the founders lies in the belief that he was originally a blacksmith, but during the Middle Ages the bare facts of his life and work became greatly embroidered with purely English detail. He becomes somehow the son of St. Catherine, and in Sussex the dual feasts became merged into one three-day session in which the children went round singing the following rhyme—

"Cattern and Clemen be here, here, here,
Give us your apples and give us your beer.
One for Peter, two for Paul,
Three for Him who made us all.
Clemen was a good man,
Cattern was his mother;
Give us your best,
And not your worst,
And God will give your soul good rest."

He is said to have been the first founder in brass, iron, and steel and to have been the first man to shoe a horse. In Staffordshire the jingle of the children again shows his connection with the blacksmiths, whose custom it had been to go on a house-to-house quest for apples. Their song was as follows—

"Clemany, Clemany, Clemany mine!
A good red apple and a pint of wine;
Some of your mutton and some of your veal,
If it is good, pray give me a deal;
If it is not, pray give me some salt.
Butter, butter, fill your bowl;
If thou fills't it of the best,
The Lord'll send your soul to rest.
If thou fills't it of the small,
Down goes butter, bowl and all.
Pray, good mistress, send to me
One for Peter, one for Paul,
One for Him who made us all;
Apple, pear, plum or cherry,
Any good thing to make us merry;
A bouncing buck and a velvet chair,
Clement comes but once a year;
Off with the pot, on with the pan,
A good red apple and I'll be gone."

"Old Clem"

The blacksmiths celebrated St. Clement's Day by dressing up an effigy who was known affectionately as Old Clem, and who was made the presiding officer in the general proceedings of the day. Sometimes Old Clem would be one of their own number, who would head a begging procession, dressed in a great-coat and mask, with long white beard and who would be carried through the streets on the shoulders of his mates; a companion would stride alongside holding a huge wooden anvil, whilst a third would carry a great wooden sledge.

There is a report of such a procession taking place in the early nineteenth century in the dockyard at Woolwich when Old Clem had to make the following speech—

"I am the real St. Clement, the first founder of brass, bronze and steel from the ore. I have been to Mount Etna, where the god Vulcan first built his forge, and forged the armour and the thunderbolts for the god Jupiter. I have been through Asia, Africa, and America; through the city of Pongrove, through the town of Jipmingo, and all the northern parts of Scotland. I arrived in London on the 23rd of November and came down to His Majesty's dockyard at Woolwich to see how all the gentlemen Vulcans came on there. I found them all hard at work, and wish to leave them well on the 24th."

Most Saints' Day festivities included the cooking of a special dish for the terminating banquet, which for St. Clement's Day was a wayzgoose. This was a leg of pork stuffed with sage and onions, and many blacksmiths regularly gave their employees a wayzgoose on that day.

Another legend which has sprung up around the life of St. Clement is that, in fleeing from his many persecutors he suffered so much from blistered feet that he put wool in his sandals. This matted the wool and when he reached safety he turned his accidental discovery into good use by creating the felt industry.

* The writer is indebted to Walsh's book on "Curiosities of Popular Customs" for much of the information contained in this article.

IVE Annual Conference

The 23rd annual conference of the Institute of Vitreous Enamellers is to be held at Gleneagles and Falkirk from June 16 to 18, 1958. The conference will include technical sessions, works' visits and special ladies' programme. The choice of June for the Institute's annual conference is a new departure, as in recent years this has been arranged for the autumn. Complete details and reply forms will be circulated to members shortly, but the following represents a provisional programme:

Monday, June 16

9.30 a.m. Annual general meeting at Gleneagles Hotel.

10.15 a.m. Presidential address by Mr. W. T. Wren.

11.0 a.m. Technical session, (1) "Works Management and Human Relations."

1.0 p.m. Luncheon.

2.15 p.m. Technical session, (2) "Abrasion Resistance Tests."

3.15 p.m. Technical session, (3) "Flame Spraying of Refractory Coatings."

5.0 p.m. Golf tournament.

7.45 p.m. Presidential reception.

8.30 p.m. Dinner, followed at 9.30 p.m. by dancing.

Tuesday, June 17

9.15 a.m. Depart from Gleneagles Hotel for day in Falkirk and works' visits to Smith & Wellstood, Limited, or M. Cockburn & Company, Limited, or Carron Company.

12.30 p.m. Luncheon.

1.45 p.m. Technical session, (4) "Zirconium Bath Enamels."

2.45 p.m. Technical session, (5) "Steel Shot and Grit for Vitreous Enamelling."

5.0 p.m. Tea at Gleneagles Hotel.

7.30 p.m. Reception prior to annual banquet at 8.0 p.m.; 9.30 p.m., dancing until 1.0 a.m.

Wednesday, June 18

10.30 a.m. Depart from Gleneagles Hotel for visit to hydro-electric plant at Pitlochry and Clunie, including motor-coach excursion in the Tummel Valley. Luncheon will be taken during the visit.

4.30 p.m. Tea at Gleneagles Hotel, followed by the conclusion of the golf tournament.

8.30 p.m. Golf dinner, followed by dancing.

The special programme arranged for the ladies will include, in addition to the joint excursion with the menfolk to Pitlochry, motor-coach excursions in the area and a visit to Perth.

All reservations for this conference, *including those for the hotel*, should be made through the IVE secretary, Mr. J. D. Gardom, Ripley, Derby.

A PUBLIC INQUIRY may be held over a dispute about the siting of a proposed new carbonization plant at Chesterfield by the Staveley Iron & Chemical Company, Limited, which wants to build it on a site next to the works of the Sheepbridge Engineering Company, Limited. Sheepbridge Engineering has objected on the ground that the plant would cause a nuisance from dust and fumes, and the company is supported by other concerns and householders. The Minister of Housing and Local Government has directed that the dispute should be referred to him.

Aluminium Prices Cut

Prices of aluminium ingot were reduced by about 2 cents a pound (just over £16 a ton) by Aluminium, Limited, from April 1. Commenting on this action, the president of the company, Mr. Nathanael V. Davis, said: "We believe this price reduction at this time when important segments of the aluminium smelting industry are idle, and when there is a widespread public demand for lower prices, will be a constructive force in improving national and world economy and will be beneficial to consumers, fabricators, and the industry as a whole."

It would also tend to make aluminium more competitive with other materials, encouraging engineers and manufacturers to design their products for more aluminium. This reduction was the first significant change in an upward price movement that began about 10 years ago.

In the United Kingdom, the new price, £180 per long ton delivered, compared with £197 previously.

Offer by Dorman Long Oversubscribed

Offer for sale by Dorman Long & Company, Limited, Middlesbrough, of 906,500 ordinary 5s. shares in Dorman Long (Africa), Limited, at 26s. a share has been oversubscribed. The offer closed on March 31. Before the application lists were opened 406,500 shares had been subscribed, leaving 500,000 shares available for public subscription.

Preferential consideration has been given to applications from existing ordinary shareholders and these have been allotted in full. Applications from others for less than 5,000 shares have also been allotted in full. Other applications have been reduced by some 10 per cent. The shares formed part of Dorman Long's holding of 2,866,500 shares in the African company.

Contracts Open

The dates given are the latest on which tenders will be accepted. The addresses are those from which forms of tender may be obtained. Details of tenders with the reference ESB can be obtained from the Board of Trade Export Services Branch, Lacon House, Theobalds Road, London, W.C.1 (telephone: CHAncery 4411, ext. 738 or 771), unless otherwise stated.

IRAN, May 10—A call for tenders has been issued by the Iranian State Railways, Tehran, for the supply of five diesel pumping sets, with a capacity of 500 gallons of water per min. (ESB/8091/58.)

CANADA—Ontor, Limited, 12, Leswyn Road, Toronto, 19, Ontario, who specialize in the distribution of heating controls and specialties, and industrial products, are interested in enlarging their scope in Canada, and in this connection would like to negotiate with United Kingdom manufacturers of such items as: feedwater pumps, cooling water pumps, large valves, small turbines, soot blower, variable speed oil or magnetic type couplings, gas compressors, gas pipe, and products for marine use. (ESB/7723/58.)

GREECE, April 16—Requirements include six tons (approx.) brass ingots, 13.3 tons pig-iron, and 1.6 tons cast brass cylinders. (ESB/7906/58.)

IRAQ, May 3—Supply of three pumping sets to the Stores of the Directorate General of Municipalities, in accordance with the general conditions and specification which can be obtained from the Enquiries Section at the Directorate, Baghdad, against payment of 3s. for each or each two copies. (ESB/8112/58.)

Tenders are also invited for the supply and erection of an air compressor to the Stores of the Directorate General of Municipalities, in accordance with the conditions and specifications which can be obtained from the Enquiries Section against payment of 2s. for each or each two copies. (ESB/8113/58.)

KOREA, April 25—Cast-iron water pipes, bell and spigot, in sizes 75 mm. to 700 mm. (ESB/8092/58/ICA.)

Notes from the Branches

East Anglian Section

The East Anglian section of the Institute of British Foundrymen lived up to its reputation at the meeting on March 18, when the now customary large gathering of members and friends welcomed a section past-president, Mr. W. L. Hardy—the speaker for the evening—and Mr. A. Talbot, London branch president, who was visiting the section with a delegation from the parent branch. The section president, Mr. R. Berry, who welcomed Mr. Talbot, said that Mr. Talbot's participation in the social function earlier in the session was well remembered; on this occasion, however, he had come to see the section at work and not at play. For his part, Mr. Talbot reminded those present that the East Anglian section was the eldest son of the London branch—and the most expensive—but, he said, it was a pleasure to come again. In concluding, he recorded his thanks for the support given to him by members during his term of office.

L. J. Tibbenham Award

Further details were then given to the meeting about Mr. L. J. Tibbenham's gift to the section, which would provide an annual prize to be awarded to the winner of a short-paper competition. Following this, Mr. Hardy, of Lake & Elliot, Limited, Braintree, presented his paper entitled "Experiences of Forty Years In and Around Foundries." (The paper has already been presented to the Beds & Herts section of the Institute and was published in FOUNDRY TRADE JOURNAL, January 2, 1958.)

The discussion which followed quickly developed on the lines of how conditions in foundries could be improved and the ways in which recruitment into foundries could be encouraged. Comparisons were made between foundries in America, on the Continent, and in this country, and the essential part which must be played in education, especially in secondary modern schools, to create an interest in industry before boys leave school.

A vote of thanks was proposed by Mr. L. A. S. Harbourne, who rightly said that Mr. Hardy was a wellknown and respected figure, not only in the section, but in the Institute generally, and his interest in all spheres of foundrywork and in the activities of the section in particular was unquestionable. On behalf of all present he thanked Mr. Hardy for a very successful evening.

Birmingham

The February meeting of the Birmingham branch was held at the James Watt Memorial Institute, when the members heard Mr. J. A. Hufton read his paper on the "Application of Automatic Controls to Mould Production in Fully- and Semi-mechanized Foundries."

Mr. Hufton commenced by saying that he wanted to show that the coining of the word "automation" had coincided with developments in pneumatic and automatic control systems and was a logical development of mechanization. He went on to say that advantages to be gained from automatic mould production included reduced costs, improved quality and increased productivity. Also, it followed that working conditions were improved, and greater use could be made of unskilled labour. With a semi-automatic machine it was possible, for moulding and knocking-out, to raise output from 6 to 12 moulds per man/hour on a 34 by 20 by 10 by 10-in. pair of moulding boxes, yet by using a fully automatic machine it was possible to raise output to 34 moulds per man/hour.

In giving details of one type of fully-automatic machine, Mr. Hufton said that this consisted of a mould-ramming unit controlled by electronic timers. It was essential, he said, that the machine should be extremely robust and have automatic lubrication. Also for the fully-automatic machine to be properly utilized, the box size must be standardized, the subsidiary equipment of high quality, and adequate and consistent sand supplies available. Further requirements were continuous melting of metal, adequate compressed-air, good maintenance (particularly of box pins, etc.), co-operation in design between supplier and user; above all, enthusiastic management was needed. Mr. Hufton illustrated his talk with two films showing the semi- and fully-automatic plant in operation, and also used a number of excellent slides.

In proposing the vote of thanks, Mr. H. G. Hall said that Mr. Hufton in his talk had demonstrated a great deal of ingenuity in the use and construction of the machines. Mr. C. T. Sandford, who seconded the proposition, remarked that the paper had illustrated the progression from relatively simple moulding processes to the complicated automatic plant and this in turn had shown how great was the impact of the engineer nowadays in the foundry industry. The meeting concluded with an interesting and lively discussion.

Northampton Section

On Saturday, February 22, the Northampton and district section held a "Brains Trust" at the Plough Hotel, Northampton. This was a repetition of a meeting which took place last winter, only this time the "brains" comprised Mr. J. A. Wilkins from the Stanton Ironworks Company, Limited, who is president of the East Midlands branch, Mr. E. R. Millac from Foundry Mechanizations, Limited, and Mr. T. H. Weaver (past-president, Birmingham branch) of W. & T. Avery, Limited. The panel answered a variety of questions in a very competent manner.

Erudite Reply

Mr. Millac particularly distinguished himself by giving the complete answer to the much discussed question of whether a large mechanized foundry producing increased numbers of castings but at higher prices was really an advance on a jobbing foundry which made much smaller quantities although the production cost per piece might be cheaper. Mr. Millac said that this was not really a problem in production costs but one in selling prices such that if a small profit per piece on a larger number of castings gave a greater yield than a larger profit per piece on a smaller number of castings, then the advantage was there regardless of a possible difference in actual production costs.

Answering a question on the use of batch-type sand-mixers as against continuous mills, Mr. Wilkins declared himself very much in favour of the batch mixer because of its flexibility in use. He also gave a series of very interesting figures for comparison of production costs of various departments of a foundry. This was in answer to a further question asking what was the recommended percentage of total production costs which could be reasonably spent on maintenance in the average foundry. Mr. Weaver dealt with many questions on moulding and with "finning" of cores, whilst particular questions on such subjects as the appearance of "rat-tails" on castings gave him ample scope for his ready wit, which the members enjoyed as much as the answers to their questions.

News in Brief

MILLSPAUGH, LIMITED, Sheffield, has received an order for the provision of new bronze liners (within which the propeller shafts revolve), for the Queen Mary.

NEW CONTACTS were made during March by the National Industrial Fuel Efficiency Service with 89 firms with an annual consumption of approximately 52,388 tons of fuel.

THE THIRD INDUSTRIAL TEXTILES TRADE FAIR will be held in the Royal Albert Hall, London, from April 14 to 18. The wide range of articles and materials will include fire-proof fabrics and protective clothing of all kinds.

THE Federation of Light Metal Smelters reports that its members' average selling prices for the month of February, calculated to the nearest 10s., were:—LM1, £155 per ton; LM2, £161 10s.; LM4, £182 10s.; LM6, £204 10s.

THE FIRST CARGO of United States steel to be brought to Sunderland arrived recently. The consignment consisted of 2,300 tons of steel plate for marine engineering and shipbuilding industries on Tyneside and Wearside.

TRINITY COLLEGE, DUBLIN, has received a gift of £5,000 towards the cost of enlarging its chemical laboratories from Imperial Chemical Industries, Limited. The new building replaces a laboratory which has been in use since 1815.

THIS YEAR the Universal Asbestos Manufacturing Company, Limited, Tolpits, Watford, is to instal a mechanized asbestos-cement pipe plant which will produce rainwater-, soil- and flue-pipes of improved quality, and certain classes of pressure pipes.

A PROSPECTUS issued by the Institute of Welding, 54, Princes Gate, Exhibition Road, London, S.W.7, giving details of the courses which are being offered by the School of Welding Technology, between April and September, 1958, is now available.

A CONTRACT for British diesel engines and spares worth £1,200,000 has been placed with D. Napier & Sons, Limited, by the Norwegian Government for 12 fast patrol boats for the Norwegian Navy. The boats are to be built by Boatservices AS, of Oslo.

AN ARRANGEMENT has been made whereby Whiffen & Sons, Limited, and the "Alfloc" water treatment service of Imperial Chemical Industries, Limited, will co-operate in the development in the UK of the use of "Zerox" (35 per cent. hydrazine solution) for the de-oxygenation of boiler feed water.

SHORT & MASON, LIMITED, Aneroid Works, 280 Wood Street, Walthamstow, London, E.17, announce that they have recently signed an agreement with Aktiengesellschaft Chemisches Institut Dr. A. G. Epprecht, Zürich, whereby they will act as sole agents in Great Britain for the range of Drage instruments.

THE ELEVENTH ANNUAL CONFERENCE of the Incorporated Plant Engineers is to be held at the Grand Hotel, Brighton, from May 14 to 16. The conference dinner will be held on the Thursday evening when the principal speaker will be Engineer Rear-Admiral Sir Sydney Frew, K.B.E., C.B., chief fuel engineer, Ministry of Power.

THE BRITISH CAST IRON RESEARCH ASSOCIATION are organizing a course on sand control, which is to be held at Alvechurch from April 22 to 25, inclusive. The attendance will be limited to a maximum of 12, and applications will be dealt with in rotation. Should, however, the number of applications exceed 12, a further course or courses will be held after a short interval.

BECAUSE OF THE REDUCTION on appeal of the original assessment of the steelworks of the Appleby-Frodingham Steel Company (branch of the United Steel Companies, Limited) by £350,000 and reductions on appeal on two other steelworks and smaller industrial properties by a total of £116,175, the product of a penny rate in Scunthorpe has dropped from £5,095 to £4,427.

NORTH BRITISH LOCOMOTIVE COMPANY, of Glasgow, have placed an order for axle-mounted gearboxes worth nearly £250,000 with David Brown Industries, Limited, Park Works, Huddersfield. British Railways recently ordered 52 main-line diesel-hydraulic locomotives from the Glasgow firm—this is reported to be the largest single locomotive order to be given to one company.

A GLASGOW EXHIBITION organized by British Oxygen Gases, Limited, emphasizes the range of cutting, planing, and welding equipment and accessories manufactured by the company. A plant is shown, suitable for all types of engineering shops, also a pictorial display showing the company's advances in its computer-controlled gas profile machine, which will be on the general market in 18 months.

Mr. GERALD W. LACEY, commercial director of the British Aluminium Company, Limited, formally opened the company's new Midland regional office at 109, Hagley Road, Birmingham, on April 1. Among those present at the opening ceremony were five other representatives of the head office, Mr. H. R. Murray-Shaw, secretary of the Aluminium Industry Council, and many executives of associated companies.

FOR the third year in succession, the marine, industrial and components divisions of Kelvin Hughes will be at the Poznan International Fair in Poland which is being held from June 8 to 22. The marine divisions exhibits will be contained in its demonstration caravan and the industrial division will this year be represented by a mobile demonstration unit housing a comprehensive display of current industrial instruments.

TO MEET THE FOREMAN'S NEED for an away-from-work opportunity to practise the principles he has been taught, the Industrial Welfare Society has designed a one-week course with the minimum of lecturing and concentration on practical exercises in speaking, interviewing, group discussion leading, report writing and study in groups. The course will be held at Robert Hyde House, 48, Bryanston Square, London, W.1, from April 28 to May 2.

THE BRITISH TRANSPORT COMMISSION announce that an order is being placed with the English Electric Company, Limited, for 22 main-line 3,300 h.p. Deltic-type diesel-electric locomotives for use on express passenger services between London (Kings Cross), Leeds, Newcastle, and Edinburgh. The order follows the use of the same firm's existing Deltic locomotive, the most powerful yet built in Britain, on trials in regular service on British Railways since November, 1955.

DISTILLERS COMPANY, LIMITED, announce that the activities of its carbon dioxide, industrial alchohol and British industrial solvents divisions in the field of industrial chemicals have been merged into a single chemical division with headquarters at Devonshire House, Mayfair Place, Piccadilly, London, W.1. The effect of this will be to centralize management, production, control, purchasing and accounting, but sales will continue to be handled by separate departments as heretofore.

Lord DUDLEY GORDON, chairman of Millspaugh, Limited, and its parent company, Hadfields, Limited,

presided at a dinner on March 28 which concluded a week's conference of the Millspaugh group at which the work of the group in Europe and the North American continent was discussed. He welcomed directors and staff from France and Canada. Mr. Georges Maupas, of Millspaugh, France, and Mr. Hedley Smith, director of the Millspaugh manufacturing company in Canada, William Kennedy and Sons, Limited, responded to the welcome.

A PRIVATE COMPANY, A. L. Curtis (Onx), Limited, has been registered to take the place of the original company, A. L. Curtis & Company, makers of refractory materials, sands, clays, etc., of Chatteris (Cambs). The original firm was founded by the late Mr. A. L. Curtis in 1906. His widow, Mrs. O. M. A. Gotto, and Mr. A. Maclennan, who has spent all his working life in the refractories industry, are the directors of the new company. Modern plant is being installed to provide better manufacturing facilities consistent with the development of the firm.

Mr. K. FAIRBURN, M.SC., head of the mechanical engineering department of the Derby and District College of Technology, Normanton Road, Derby, announces that in order to cover adequately the increased content of the City and Guilds examinations in foundry practice and patternmaking it is proposed to extend the part-time day attendance by apprentices from one half-day to a whole day a week. Moreover, it is proposed that there should be compulsory attendances on two evenings a week. Mr. Fairburn has circularized this information to the local foundries and has enclosed a syllabus.

THE MIDLAND COUNCIL of the National Union of Manufacturers has begun a study of the means of strengthening the exports salesmanship of smaller firms in the region, in preparation for the European Common Market. Mr. J. W. Bache, sales director of Austin Motor Exports Corporation, and chairman of the special sub-committee which has been formed to organize the study, announced recently that a conference is being arranged in Birmingham on May 5 to which manufacturers from all parts of the Midlands are being invited. One aim of the sub-committee is to encourage small firms which have so far concentrated on the home market, to enter the overseas markets. Another project which is being examined is a scheme by which small firms would create their own collective overseas sales organizations by the use of export sales units. The latter plan has already been promised support in several provinces of Canada.

Mr. BILL KIRK, managing director of the Lawden Manufacturing Company, Limited, gave a provocative talk at the April meeting of the Non-Ferrous Club at the Queen's Hotel, Birmingham, on labour questions. At this meeting a collection was taken on behalf of the National Society for the Prevention of Cruelty to Children, the sum of £17 10s. 0d. being realized. Plans are now in hand for the formation of a golf club for members of the Non-Ferrous Club. The annual subscription will be one guinea and this will be used to defray the expenses of prizes, etc. A meeting is to be held at Stratford-on-Avon Golf Club on June 26, when a morning round will be played, followed by luncheon in the Club House with a foursome match in the afternoon. Dinner has been arranged at the Welcombe Hotel, Stratford-on-Avon for the evening. Anyone interested in this meeting or in becoming members of the Non-Ferrous Golf Club should write to Mr. T. B. Taylor, 115, Charles Henry Street, Birmingham, 12.

Exhibition Briefs

Factory Equipment

The sixth Factory Equipment Exhibition is to be held at Earls Court, April 14-19, and among exhibitors the following will be of interest to those concerned with industrial administration and organization.

BRITISH NYLON SPINNERS, LIMITED, of London, will exhibit nylon clothing as used in industry.

RILEY (IC) PRODUCTS, LIMITED, of Woburn Place, London, W.C.1, are exhibiting (*Stand B.88*) mechanical stokers, including the "Direkto" model, incinerators for refuse disposal, oil-burner equipment, and electric vibratory equipment.

SHELL-MEX AND B.P., LIMITED, Strand, London, W.C.2, are staging an oil-fuel centre. Twenty-seven firms manufacturing industrial oil-burning equipment are co-operating with the company in displays of their latest plant, and will be grouped round the central Shell-Mex and B.P. stand. Visitors will be able to discuss their oil-firing needs and problems with technical representatives of Shell-Mex and B.P. Limited, and of the equipment manufacturers.

COLT VENTILATION, LIMITED, of Surbiton, Surrey, will exhibit (on *stand No. C.24*) their industrial equipment for natural and mechanical ventilation and heating by economic oil-fired air heaters, and also their fire-safety venting system. Visitors will see the dual-purpose fire vents, operated both by fusible link to cope with a fire emergency and by manual control for daily ventilation use, and a continuous sound film showing how the ventilators behave in a real fire will be shown.

E. P. BARRUS (CONCESSIONAIRES), LIMITED, of Acton, London, will display a wide range of new equipment in "Blackhawk" hydraulic equipment and "Devcon" plastic steel. Among these will be "Porto-Power" hollow rams, 3-in. pipe benders, wear-resistant plastic steel, and plastic steel flex. Also on show will be the "Stanley Discut" machine, and a wide range of twist drills and tool bits. These latter, it is announced, are again available in this country following the establishment of a British factory at Peterhead, Scotland.

ADAPTA-CHARTS, LIMITED, of Hammersmith, London, will exhibit an improved version of the Movigraph Rotadate wall chart. A representative selection of the current models, for industrial and commercial applications, will also be shown. These cover such situations as machine loading, stock control, and planning.

THE MINNESOTA MINING AND MANUFACTURING COMPANY, LIMITED, of London, Birmingham and South Wales will exhibit (*at stand* 26) a representative selection of its diverse and widening range of industrial products. The stand will incorporate displays of packaging, magnetic and electrical tapes, reflective sheeting in its industrial applications, non-slip surfacing, copying products and 3M printing product. A new accident-prevention aid, "Safety Walk," will also be on view. Designed for factory floors, stairways, ramps and gangways the surfacing offers, it is claimed, protection against falls and also increases the traction and efficiency of all power-driven equipment.

NORTH CENTRAL WAGON & FINANCE COMPANY, LIMITED—Mr. R. J. Ramsden and Mr. P. J. Greaves have been appointed joint managing directors. Mr. Duncan McIntosh, previously secretary of the company, has been appointed deputy managing director and Mr. J. C. Middleton has been appointed to the board. Mr. A. E. Keeler has been appointed secretary.

Personal

Mr. A. T. WEBSTER has been appointed manager of the Australian branch of Leyland Motors, Limited.

Mr. W. T. UNDERWOOD, chief accountant of Harland and Wolff, Limited, has been made a director of the company.

The retirement is announced of Mr. W. H. GRINSTED, O.B.E., director of engineering of Siemens Edison Swan, Limited.

Mr. ANDRE GRANDPIERRE, president of the Pont à Mousson Company has been created a Grand Officer in the National Order of the Legion of Honour.

Dr. FORREST F. MUSGRAVE has been appointed personal assistant to Mr. SYDNEY BARRATT, chairman of the Albright and Wilson group of companies.

Mr. D. P. BRISCOE has been appointed district sales engineer in charge of the Nottingham territory of the British Thomson-Houston Company, Limited.

Mr. R. C. HEYS, managing director of Millspaugh, Limited, Sheffield, on March 31 celebrated 24 years with the firm and Hadfields, Limited, the parent company.

Mr. F. S. MIDDLETON, local director and manager of the export department of Thos. Firth and John Brown, Limited, has retired after 48 years with the company.

Mr. E. W. ELLIOTT has retired from the board of L. Sterne & Company, Limited, manufacturers of refrigerating machinery, Crown Iron Works, Glasgow, and Sternett Works, Hillington.

Mr. A. B. HAMPTON has been appointed deputy chairman of C. and J. Hampton, Limited, following the death of Mr. D. WOODLIFF. Col. G. V. HUNT and Mr. P. WOOLASS have been appointed to the board.

At the annual meeting of the Midland Scrap Iron, Steel and Metals Association, Mr. E. W. PUGH, was elected president in succession to Mr. G. AYMER BARROW, president-elect of the National Federation.

Mr. CHARLES JOHN CARDER has been appointed secretary of Wolverhampton Chamber of Commerce in succession to Mr. V. B. BEAUMONT, who is retiring from the position at the end of June. Mr. Carder is at present in the Trade Association Department of the Birmingham Chamber of Commerce.

Mr. W. E. A. WILLIAMS has been appointed technical representative on the welding-rod side, in the London and south-east England areas for Suffolk Iron Foundry (1920), Limited. Mr. Williams will operate from 100, Preston Lane, Tadworth, Surrey (telephone: Burgh Heath 6536).

Mr. WILLIAM HENRY MINCKLEY, foundry superintendent of Ruston & Hornsby, Limited, engineers, Grantham, retired on March 28 after 54 years' service with the firm. He received from Mr. R. C. Shepherd, a director, presentations on behalf of his Grantham and Lincoln colleagues, and the staff of his section.

Mr. F. WATKINSON retired on March 31 after 47 years' service with Thos. W. Ward, Limited, Albion Works, Sheffield. He was registrar of the parent company for many years, and from 1947 was secretary of the Ketton Portland Cement Company, Limited. He received presentations from senior colleagues and from the staff of his department.

Dr. M. A. T. ROGERS has been appointed research controller of Imperial Chemical Industries, Limited. He succeeds Mr. R. M. WINTER, who is retiring from the company after 30 years' service. Dr. Rogers, who is 47, joined the dyestuffs division of ICI as a chemist in 1934 and became head of the academic relations department of that division in 1949.

At the February meeting of the new technical committee of the Italian Foundry Centre, Dr. MARIO BARBERO, the technical director of the FIAT foundries was elected president. Elected members of the Council were:—Dr. MARIO CONTI; Professor RAOUL DUPUIS; Dr. ROBERT SACERDOTE; Dr. GUGLIELMO SOMIGLI; Mr. VINCENZO ZAGNOLI and Mr. GUISEPPE ZIGIOTTI.

Mr. K. E. SHENTON, joint managing director of James W. Shenton, Limited, ironfounders, of Great Bridge, was, on April 2, installed as president of the West Bromwich, Smethwick and District Manufacturers' Association. Mr. Shenton is also a member of the executive committee of the National and Midland Ironfounders' Association as well as of the Staffordshire Iron and Steel Institute.

The President of the Board of Trade, the Rt. Hon. SIR DAVID ECCLES, is to leave for a fortnight's visit to Venezuela, Trinidad and Brazil on April 26, with the objective of stimulating increased interest in United Kingdom trade with these countries. Besides meeting members of the Governments and industrial and commercial leaders in Caracas and Rio de Janeiro, he will visit the oilfields in Venezuela and the industrial centre of Sao Paulo in Brazil.

Sir JOHN WOODS, G.C.B., M.V.O., a director of English Electric Company, Limited, has, owing to pressure of other work, resigned as chairman of the Board of Trade's Advisory Committee on the Revolving Fund for Industry. Sir John has been chairman since the Committee was appointed in July, 1953. Colonel E. R. MAYER, who succeeds Sir John, is managing director of Metlex Industries, Limited, and a member of the Executive Council of the National Union of Manufacturers. He has been a member of the Advisory Committee since its inception.

Mr. G. G. ROBERTS, technical director of Smiths Aircraft Instruments, Limited, and Mr. J. E. N. HOOPER of the Ministry of Supply were presented with the Musick Memorial Trophy by Mr. R. M. CAMPBELL, Acting High Commissioner for New Zealand, on March 27. The trophy is awarded to the group or individual which makes the most practical contribution to the safety of aircraft with special regard to trans-oceanic aviation. Mr. Roberts and Mr. Hooper share the award for work they did on cloud and collision warning radar at the Royal Radar Establishment, Malvern.

Obituary

The death is announced of Mr. G. T. GOUGH, who died recently in his 81st year. He had been on the board of the Star Foundry Company, Limited, Bradley, Bilston, Staffs, since its inception in 1918, and was actively engaged in business of an associated company, Bradsteds, Limited, of Bilston, as chairman and managing director up till three weeks before his death.

The death took place on March 20 of Lord AIREDALE. He was 75. One of the original directors of the Ford Motor Company, Limited, when it was formed in 1928, and chairman from 1948 to 1954, Lord Airedale had many associations with the iron and steel industry. As deputy chairman of Dorman, Long & Company, Limited, he attended the opening of the Sydney Bridge, Australia, in 1932. He was also a director at one time of the Monk Bridge Iron & Steel Company, Limited, and at the time of his death was a director of several concerns, including the Ford Motor Company.

Raw Material Markets

Iron and Steel

Most of the ironfoundries had sufficient supplies of raw materials on hand to enable them to suspend deliveries during the Easter holiday. Only engineering and speciality foundries—and not all of them—carry order-books which ensure production at satisfactory levels for a reasonable period ahead. Foundries catering for the motor vehicle trade continue to be the most favourably situated.

There is a steady flow of orders for high-duty castings from the heavy engineering trades, power and electrical plant manufacturers, and others, but the demand from the machine-tool trade shows an appreciable reduction from previous levels. The light, textile, and many of the jobbing foundries continue to be only moderately employed. In the light-castings trade there is no sign of any material expansion in requirements.

Pig-iron production is adequate for all purposes. The steelworks are receiving plentiful supplies of basic iron and producers could step up deliveries if they were required to do so. In the foundry grades, the low-phosphorus irons are in heavy demand, but the increased production is satisfying requirements. Hematite is in fairly good call and adequate tonnages are available. Production of the high-phosphorus irons continues to be more than sufficient to meet current demands, and appreciable stocks are held by the makers.

Most grades of foundry iron and hematite are available for export, and a few orders continue to be received from overseas buyers, despite the strong competition from makers abroad. Most of the foundries have plentiful supplies of scrap.

The re-rollers lack orders, and although some departments of the heavy finished steel trade are still well engaged, there is a noticeable slackening of the pressure of demand in most directions.

Non-ferrous Metals

Although the copper price in London has receded a few points from its recent peak, the undertone is firm. This is due to the combination of the continued demand from Europe, the satisfactory turnover on the London Metal Exchange, and the fact that stocks in the UK have shown very little change in the past few weeks. It was reported from Santiago on Monday that the strike at the Anaconda Company's Chuquicamata mine —another factor serving to strengthen the market in Whittington Avenue—had cost about 5,000 metric tons of copper since April 1.

It is, incidentally, the first strike of any significance in a major producing area in over two years. However, news from the other side of the Atlantic is still depressing and reports have it that producers' copper is moving very slowly indeed. Custom smelters, on the other hand, have experienced reasonable trading conditions, although activity on Comex has fallen off perceptibly.

The start of the second quota period for tin producers on April 2 found offerings of the metal in the East relatively heavy with the result that a sharp fall in the Eastern quotation ensued. The repercussion extended to Whittington Avenue and the tin market in London ran once more into a backwardation. More than that, the buffer stock manager was again obliged to support the cash price at £730 a ton to a greater extent than for some time past. However, by the end of the period the backwardation had closed up considerably and spot metal was above the support point. In the US the market continues thin and the price under 93 cents a pound.

The feature in lead was the cut in the US price by a full cent to 12 cents a pound. Most observers feel that this price level can be maintained, but there are those who believe that unless there is the expected upturn in the US economy no amount of production cutbacks will save it from falling lower. Meanwhile, figures released by OEEC giving production statistics for February reveal that output, allowing for the shorter month, is virtually unchanged from that in January. The shorter working week recently adopted by Consolidated Zinc and New Broken Hill, the big two Australian producers, is having a marked effect and output in the four weeks to March 8 was down by 15 per cent. at Consolidated Zinc and 14 per cent. at New Broken Hill.

Zinc, despite the news that after the intake for March the US stockpiling authorities will make no further purchases, has been surprisingly firm in London. This is probably due to the fact that production cutbacks in zinc have been fairly heavy throughout the world. In the US output in January recorded a 21 per cent. decrease on the same month a year ago, while in Australia, for the four weeks ending March 8, output at Consolidated Zinc dropped by 23 per cent., and that of New Broken Hill by 19 per cent. In the US the market is quiet and the price is 10 cents a pound.

Iron-ore Imports

Iron-ore imports in February, and the totals for the first two months of this year and last, are shown below.

From	Month ended Feb. 28.	Two months ended February 28.	
	1958.	1957.	1958.
	Tons.	Tons.	Tons.
Sierra Leone	63,345	85,494	132,530
Canada	42,630	122,853	118,575
Other Commonwealth countries and Eire	—	3,225	—
Sweden	258,170	546,406	636,084
Norway	9,664	25,706	35,550
France	66,338	91,302	102,645
Portugal	15,410	16,801	28,311
Spain	46,171	161,180	122,822
Algeria	125,213	228,472	258,129
French West Africa	53,031	87,386	93,356
Tunisia	61,470	122,684	141,872
Northern Morocco	13,070	21,988	17,450
Southern Morocco	38,550	18,700	66,750
Liberia	26,170	58,520	47,390
Venezuela	139,976	164,259	361,639
Brazil	43,940	89,028	96,307
Other foreign countries	17,550	19,659	37,403
TOTAL	1,020,698	1,863,663	2,296,813

Denial from Yale and Towne : It is regretted that the announcement on page 364 of the JOURNAL of March 27 was inaccurate, though received from an esteemed correspondent of long standing. It reported the taking over of a factory on the Kilbride Estate, near Glasgow, by the Yale and Towne Manufacturing Company, Limited. We have been assured that the firm, located at Wednesfield (and not Wednesbury), are not taking over any new factory in Scotland.

Mr. G. S. ANDREWS, chief buyer at Ransomes Sims & Jefferies, Limited, of Ipswich retired on March 31 after 55 years service with the company. He received from Mr. H. H. Dawson (works director) a cheque on behalf of the directors and his colleagues. Mr. Andrews is being succeeded by Mr. PETER DORLING late of B. Elliott & Company, Limited, Victoria Works, Willesden.

Current Prices of Iron, Steel, and Non-ferrous Metals

(Delivered unless otherwise stated)

April 9, 1958

PIG-IRON

Foundry Iron.—No. 3 IRON, CLASS 2:—Middlesbrough, £21 6s. 0d.; Birmingham, £20 18s. 3d.

Low-phosphorus Iron.—Over 0.10 to 0.75 per cent. P, £23 17s. 0d., delivered Birmingham. Staffordshire blast-furnace low-phosphorus foundry iron (0.10 to 0.50 per cent. P, up to 3 per cent. Si), d/d within 60 miles of Stafford, £24 1s. 3d.

Scotch Iron.—No. 3 foundry, £25 3s. 6d., d/d Grangemouth.

Cylinder and Refined Irons.—North Zone, £25 19s. 0d.; South Zone, £26 1s. 6d.

Refined Malleable.—P, 0.10 per cent. max.—North Zone, £27 6s. 6d.; South Zone, £27 9s. 0d.

Hematite.—Si up to 2 per cent., S. & P. over 0.03 to 0.05 per cent.:—N.-E. of England (local iron), £25 6s. 6d.; Scotland (Scotch iron), Zone S.1, £25 13s. 0d.; Sheffield, £26 15s. 0d.; Birmingham, £27 4s. 0d.; Wales (Welsh iron), £25 6s. 6d.

Basic Pig-iron.—£20 3s. 0d., delivered Staffs, Derbyshire, Notts, Lincs, Rutland, Northants, and Leics.

FERRO-ALLOYS

(Per ton unless otherwise stated, delivered)

Ferro-silicon (6-ton lots and over).—45 per cent. Si, £47 10s. 0d. to £48 0s. 0d., scale 17s. 0d. per unit; 75 per cent. Si, £67 0s 0d. to £67 10s. 0d., scale 17s. 0d. per unit.

Ferro-vanadium.—50/60 per cent., 22s. 6d. per lb. of V.

Ferro-molybdenum.—65/70 per cent., carbon-free, 12s. 6d. per lb. of Mo.

Ferro-titanium.—20/25 per cent., 2-3 per cent. Cu, £250 0s. 0d.; 38/40 per cent., commercially carbon-free, £299 0s. 0d.

Ferro-tungsten.—80/85 per cent., 8s. 1d. per lb. of W.

Tungsten Metal Powder.—98/99 per cent., 11s. 1d. per lb. of W.

Ferro-chrome (6-ton lots and over).—4/6 per cent. C, £91 10s. 0d., basis 60 per cent. Cr, scale 30s. 0d. to 30s. 6d., per unit; over 6 per cent. C, £87 10s. 0d., basis 60 per cent. Cr, scale 30s. 6d. per unit; 2 per cent. C,* 2s. 1d. to 1½d. per lb. Cr; 1 per cent. C,* 2s. 1½d. per lb. Cr; 0.15 per cent. C,* 2s. 2½d. per lb. Cr; 0.10 per cent. C,* 2s. 2¾d. per lb. Cr; 0.06 per cent. C,* 2s. 3d. per lb. Cr.

Metallic Chromium.—98/99 per cent., 7s. 3½d. to 7s. 10½d. per lb.

Metallic Manganese.—94/96 per cent., carbon-free, £282 0s. 0d.; 96/98 per cent., £315 0s. 0d.

Ferro-columbium.—65/75 per cent., Nb + Ta, 20s. 9d. per lb., Nb + Ta.

Ferro-manganese (home).—78 per cent., £83 0s. 0d.

SEMI-FINISHED STEEL

Re-rolling Billets, Blooms, and Slabs.—BASIC: Soft u.t., £32 15s. 6d.; tested, 0.08 to 0.33 per cent. C, £33 15s., 6d.; hard (0.41 to 0.60 per cent. C), £34 17s. 0d.; silico-manganese, £43 16s. 6d.; free-cutting, £36 14s. 6d. SIEMENS MARTIN ACID: Up to 0.25 per cent. C, £41 1s. 0d.; silico-manganese, £44 4s. 0d.

* Average 68-70 per cent.

Billets, Blooms, and Slabs for Forging and Stamping.—Basic, soft, up to 0.33 per cent. C, £38 10s. 0d.; basic, hard, over 0.41 up to 0.60 per cent. C, £39 12s. 6d.; acid, up to 0.25 per cent. C, £43 4s. 0d.

FINISHED STEEL

Heavy Plates and Sections.—Ship plates (N.-E. Coast), £42 2s. 0d.; boiler plates (N.-E. Coast), £44 12s. 0d.; floor plates (N.-E. Coast), £43 11s. 0d.; angles (N.-E. Coast), £39 16s. 6d.; joists (N.-E. Coast), £39 12s. 6d.

Small Bars, Sheets, etc.—Rounds and squares, under 3 in., and flats, 5 in. wide and under, untested soft basic, 50 tons and over, £40 0s. 6d. (under 10 tons to 4 tons, £40 18s. 0d.; under 4 tons to 2 tons, £41 3s. 0d.); hoop and strip, coils, £39 0s. 0d.; uncoated strip mill coils, hot rolled, under 3mm. to 12g., £44 16s. 0d.; black sheets (hand mill), 24g., £58 14s. 6d.; galvanized corrugated sheets, 24g., £66 16s. 0d.

Alloy Steel Bars.—1 in. dia. and up: Nickel, £68 10s. 0d.; nickel-chrome, £99 11s. 0d.; nickel-chrome-molybdenum, £111 19s. 0d.

NON-FERROUS METALS

Copper.—Cash, £173 0s. 0d. to £173 10s. 0d.; three months, £173 15s. 0d. to £174 0s. 0d.; settlement, £173 10s. 0d.

Copper Tubes, etc.—Solid-drawn tubes, 1s. 9d. per lb.; rods, 202s. 3d. per cwt. basis; 20 s.w.g., 235s. 6d. per cwt.

Tin.—Cash, £732 10s. 0d. to £733 10s. 0d.; three months, £729 10s. 0d. to £730 0s. 0d.; settlement, £733 10s. 0d.

Lead (Refined Pig).—First half April, £71 15s. 0d. to £72 0s. 0d.; first half July, £72 0s. 0d. to £72 5s. 0d.

Zinc.—First half April, £62 0s. 0d. to £62 5s. 0d.; first half July, £62 0s. 0d. to £62 5s. 0d.

Zinc Sheets, etc.—Sheets, 15g. and thicker, all English destinations, £96 10s. 0d.; rolled zinc (boiler plates), all English destinations, £94 5s. 0d.; zinc oxide (Red Seal), d/d buyers' premises, £85 10s. 0d.

Brass Tubes, etc.—Solid-drawn tubes, 1s. 5½d. per lb.; sheets to 10 w.g., 156s. 3d. per cwt.; wire, 2s. 2⅛d.; rolled metal, 156s. 3d. per cwt.

Brass (Brazing).—BS1400, B3 (65/35), £129; B6 (85/15), — ; BS249, —.

Brass (High Tensile).—BS1400, HTB1 (30 tons), — HTB2 (38 tons), — HTB3 (48 tons), —

Gunmetal.—BS1400, LG2 (85/5/5/5), £156; LG3 (86/7/5/2), £166; G1 (88/10/2/½), — (88/10/2/1), —

Phosphor Bronze.—BS1400, PB1 (AID released), £240 per ton.

Phosphor Bronze Strip, etc.—Strip, 230s. 9d. per cwt.; wire, 3s. 6½d. per lb.; rods, 2s. 9½d.; tubes, 2s. 9¾d.; chill cast bars: solids 2s. 10½d.; cored 2s. 11½d. (CHARLES CLIFFORD, LIMITED.)

Nickel Silver, etc.—Rolled metal, 3 in. to 9 in. wide × 0.056, 3s. 5d. per lb.; round wire, 10g. in coils (10 per cent.), 3s. 9¾d.; special quality turning rod, 10 per cent., ½ in. dia., in straight lengths, 3s. 8¾d. All prices are net.

Other Metals.—Magnesium, ingots, 2s. 5½d. per lb. Antimony, English, 99 per cent., £190 0s. 0d. Quicksilver, ex-warehouse, £77 0s. 0d. Nickel, £600 0s. 0d. Aluminium ingots, £180 0s. 0d.; aluminium bronze (BS1400), AB1, £203; AB2, £225.

BILSTON

Rolled Steel MOULDING BOXES

Interchangeable · Accurately jigged and reamed. Withstand rough handling. Long life without distortion. Sizes and shapes to requirements.

BILSTON STOVE & STEEL TRUCK CO. LIMITED
BILSTON • Phone: BILSTON 41921 • STAFFS

• Agents for London & the Home Counties, FOUNDRY SUPPLIERS LIMITED. 25A, Cockspur St, London, S.W.1 'Phone: TRAfalgar 1141

PIG IRON

Low Phosphorus
Refined & Cylinder
Hematite
Malleable
Derbyshire
Northamptonshire
Swedish Charcoal

Ferro Silicon (12-14%)
Alloys & Briquettes
N.F. Metals & Alloys
Limestone
Ganister
Moulding Sand
Refractories

WILLIAM JACKS & Co. LTD.
Winchester House, Old Broad Street
TELEPHONE: LONDON WALL 4774 (8 Lines) London, E.C.2.

Birmingham, 2. 39, Corporation Street. MIDLAND 3375/6.
Liverpool, 2. 13, Rumford Street. CENTRAL: 1558
Glasgow, C.2. 93, Hope Street. CENTRAL: 9969.

Company News

JAMES H. LAMONT & COMPANY, LIMITED, engineers and brassfounders, of Edinburgh—Profit for 1957 was £34,199, against £26,609 in 1956, after tax of £49,483 (£37,318), etc. A final dividend of 20 (15) per cent. makes 25 (20) per cent.

GENERAL ENGINEERING COMPANY (RADCLIFFE), LIMITED—The dividend is being raised from 25 per cent. to 30 per cent. for the year to November 30, 1957. Net profit of £69,707 compares with £69,512, after tax of £76,000 (£71,850).

BRITISH ROLLMAKERS CORPORATION, LIMITED—Group trading profits rose to £892,676 (£678,935) in 1957 and the dividend is raised from 12 to 14 per cent. with a 10 per cent. final. After the customary allowances the net profit available for disposal is £395,333 (£281,183).

HURST NELSON & COMPANY, LIMITED, railway wagon builders, etc., of Motherwell (Lanarkshire)—Charles Roberts & Company, Limited, Wakefield, announces that the offer for all ordinary shares of the company is declared unconditional, subject to permission to deal being granted by the London Stock Exchange. It is added that acceptances exceed 85 per cent.

ADAMANT & WESTERN ENGINEERING COMPANY, LIMITED—The company announces an interim dividend of 3 per cent. in respect of the year ending June 30, 1958, as compared with 4½ per cent. previously. The directors state that difficulties to which the chairman referred in his annual statement are still persisting. A 7½ per cent. final made a 12 per cent. total for 1956-57.

A. REYROLLE & COMPANY, LIMITED, electrical engineers, of Hebburn (Co. Durham)—Higher profits and a maintained dividend total of 17½ per cent., with an unchanged 11 per cent. final, are announced for 1957. Following the previous year's setback, profits are improved at £2,762,274 (£2,563,273). After heavier UK tax of £1,409,188 (£1,303,353), the net profit is £1,353,086 (£1,259,920). The 1957 dividend total is on the present £4,579,411 ordinary, as also was the 1956 final; the interim for that year was on £3,052,941 prior to the rights issue.

SWAN, HUNTER, & WIGHAM RICHARDSON, LIMITED—The company is raising its dividend by 4 per cent. to 18 per cent. for 1957. Following the increased 5 per cent. (3 per cent.) interim, the final is 13 per cent., against 11 per cent. Group profits are down by £344,000 at £3,054,757, but after reduced tax and lower outside interests, the balance attributable to the company is more than maintained at £1,493,663 (£1,482,952). The final 1957 ordinary and preference dividends are payable on capitals increased by £369,774 and £56,340, respectively, following the acquisition of the minority shareholdings in the Wallsend Slipway & Engineering Company, Limited.

DELTA METAL COMPANY, LIMITED—The company recommends a final dividend for 1957 of 15 per cent., plus a bonus of 5 per cent. on the £1,750,000 capital. This makes, with the 10 per cent. interim on £2,000,000 capital, 30 per cent., less tax, for the year, as forecast. For 1956 a total of 17½ per cent., tax free, was paid—interim 6 per cent. on £1,750,000, final 9 per cent. and bonus 2½ per cent. on £2,000,000. Group profit, before tax, including three months' profit from James Booth & Company, Limited, amounting to £67,573, and "base stock" credits totalling £357,000 (£153,000), is £1,533,107, compared with £1,753,121. During the year the capital was increased by shares issued against acquisitions—from £2,000,000 to £2,750,000—in connection with the James Booth acquisition and to £2,915,000 for the balance of the Sanbra ordinary shares.

Forthcoming Events

APRIL 12

Institute of British Foundrymen

West Riding of Yorkshire branch: Annual general meeting followed by film show and presentation of prizes in the S. W. Wise Memorial Competition, 6.30 p.m., at the Bradford Institute of Technology.

APRIL 15

Association of Bronze & Brass Founders

London area: Discussion of Association matters from 11.45 a.m. until luncheon at 1 p.m. After luncheon at 2.15 p.m. symposium on cleaning and fettling of castings. The meeting will be held at the Clarendon Restaurant, Hammersmith.

Institute of British Foundrymen

Coventry and district section: Annual general meeting, followed by a film show arranged by Foundry Services, Limited. 7.30 p.m. at the Coventry Technical College, Room A.5.

East Anglian section: Annual general meeting at 7.15 p.m., followed by an "Open Discussion" on foundry topics and problems. To be held at the Lecture Hall, Public Library, Ipswich.

APRIL 16

Society of Chemical Industry

Corrosion group: Annual general meeting and "Corrosion Research and its Industrial Background," by W. H. J. Vernon, 6.30 p.m., at 14, Belgrave Square, London, S.W.1.

Institute of British Foundrymen

North East Lancashire section: Annual general meeting, followed by foundry films, 7.30 p.m., at the College of Further Education, Sandy Lane, Accrington.

APRIL 17

Institute of British Foundrymen

Northampton and district section: Annual general meeting followed by "Behaviour of Moulding Sands at High Temperatures," by W. B. Parkes and R. G. Godding, 7.30 p.m. at the Georgian Room, Hind Hotel, Wellingborough.

Lincolnshire branch: Annual general meeting, 7.15 p.m., at the Technical College, Lincoln.

Incorporated Plant Engineers

Blackburn branch: "Work-study in the Smaller Factory," by P. A. Gibbs, 7.30 p.m., at the Golden Lion Hotel.

Institution of Mechanical Engineers

Applied Mechanics group: Discussion on "Training in Engineering Design," 6 p.m., at 1, Birdcage Walk, Westminster, London, S.W.1.

APRIL 18

Institute of British Foundrymen

East Midlands branch: Annual dinner/dance, at the University, University Park, Nottingham.

New Patents

(Copies of complete specifications are obtainable from the Patent Office, Sales Branch, 25, Southampton Buildings, Chancery Lane, London, W.C.2, price 3s. 6d.)

790,177. Pierre Coheur, 4, Place D'Italie, Liége, Belgium.

A method of producing steel from pig-iron by blowing an oxidizing gas through the bottom of the converter during the whole of the conversion. A supplementary oxygen-containing gas is simultaneously injected on to the surface of the bath, from the beginning of the conversion, at least until a liquid slag is created.

790,478. National Research and Development Corporation, 1, Tilney Street, London, W.1.

A method and apparatus for producing shell moulds for casting. A patent, previously taken out by the Corporation (No. 756,550, FOUNDRY TRADE JOURNAL, November 1, 1956) specifies a method whereby the process was carried out using a stationary pattern at a single station. The object of the present invention is to provide an alternative method of producing the shell moulds at a single station. A single pattern is, therefore, arranged to be fed with just sufficient investment material to form the shell mould so that means for removing surplus material are not required.

Mr. Walter Jones is vice-chairman of the joint advisory committee at John Summers. When his health made it desirable for him to retire from the sheet finishing department (above), he was found lighter work. "We couldn't have better people to work for," says Mr. Jones.

10,000 men work at John Summers. So many come to work by car and motor-cycle that they have special labels to help the works traffic control. Over 3,000 labels have been issued.

In this works one man in three drives to the job

Trevor Evans, Daily Express Industrial Correspondent, went to Wales and found an inspiration—and a challenge.

I WISH every industrialist in Britain had come with me to the steelworks by the Dee. What I saw was an inspiration. And a challenge.

There is no reason to suppose that this place, about five miles outside the boundaries of historic Chester, is out of step with the rest of the industry.

Mr. Richard Summers, the chairman of the company, was driving me through his works when I commented how odd it was to see a car park around the corner of almost every building. Finding more space for motor-cars was going to be a problem, he said. Whose cars?

10,000 Acres

HE looked at me in some surprise. Why, he said, the people who work here. Then he explained that so big is this site – it stretches over 10,000 acres, though so far buildings, offices, mills, furnaces and coke ovens occupy only about one-quarter of the Summers' land – that every vehicle bears a special label to speed its coming and going through the patrolled gates.

There are 10,000 working here. Nearly one-third come to work in motor-cars or motor-cycles. I thought Mr. Summers was talking loosely, in general terms. He wasn't. Nearly 3,200 labels have been issued. New applications are coming in daily.

First hands at the furnaces frequently take home more than £30 a week. The odd one has been known to take home £40 at a peak period, and the average for all is £15 a week.

Expansion

MR. SUMMERS explained to me how the present production of 1,000,000 tons of steel, mainly in sheets for motor-cars, drums and such household goods as refrigerators and washing machines, would be up to nearly 2,000,000 tons a year in about three years' time. "We go ahead, whatever happens," he said.

I saw ample evidence of expansion for the future, even to reclaiming land from the tidal water by battering down the refuse from the plant, thus adding a bit more to Wales.

Peace

ONE of the most impressive men I met at Shotton was Mr. Walter Jones, leading member of the steelmen's union, and vice-chairman of the works joint advisory committee. A thoughtful, deliberate kind of man with more than 40 years' service at the plant. "We couldn't have better people to work for," he says.

Management and workers have known each other long enough. This is largely a family affair.

It was old John Summers who inspired all this. He used to make clog irons in Stalybridge, Cheshire, more than 100 years ago.

He decided to make his own nails, so he made rough steel sheets. His son, Henry Hall Summers, bought this bleak land on the banks of the Dee in the nineties of last century. And Henry's son, Richard, is now the head of the concern.

There are all sorts of joint organisations on all aspects, from production to safety and sports.

This plant, like most others in steel, has a remarkable record of internal peace. There was dispute in 1911 – between two unions. But of official strikes against the management, none at all.

What can be wrong with an industry which commands the energy and loyalty of a lifetime's service from men of pride and skill?

ISSUED BY THE BRITISH IRON AND STEEL FEDERATION

Book Reviews

Casting in Steel. Published on behalf of the British Steel Founders' Association by Sir Isaac Pitman & Sons, Limited, Parker Street, Kingsway, London, W.C.2; price 15s. net.

A foreword to this book written by Mr. G. Macbeth Menzies, the president of the British Steel Founders' Association, concludes with these words: "I commend the volume to all those who are interested to know, in broad terms, what steel castings are, how they are made, the basic principles of design, the variety of composition and mechanical properties that can be obtained, and the tests and inspection techniques used to ensure that steel castings quality shall not fall short of the customer's requirements." The reviewer endorses this recommendation wholeheartedly, and does so on the grounds that the book has no pretensions to being a metallurgical textbook, but tells a simple story covering the phases set out by Mr. Menzies. Rightly, design is stressed, for this is the factor where the user can be most helpful to the manufacturer of steel castings. The chapter on patterns is quite useful as it points out all the various types available and their uses, with suggestions as to varnishing, shrinkage allowances, finishes and the like. The value of the book is enhanced by the abstracting in it of B.S. specifications for steel castings—of which there are no fewer than 17 to choose from—and the inclusion of a glossary of steelfoundry terms. This is an excellent, popular, but not too "popular" book of steel castings.

V. C. FAULKNER.

Advanced Patternmaking, by L. L. Cox. Published by the Technical Press, Limited, 1, Justice Walk, Chelsea, London, S.W.3; price 45s. net.

Students of patternmaking for any purpose will find this book informative and instructive. It is compiled in an academic style and appears to be based largely on questions set in City and Guilds examination papers.

The text commences with an unfortunate example in the first chapter, where a categorical statement regarding self-cored patterns would be hotly contested by many practical foundrymen. This, and a few other faults, mar a good job of work which otherwise could have placed the book very high in its category, and well justified the title. As it is, a title such as "Patternmaking for the Advanced Student" would be more applicable, especially as the practical information given in the text is mostly centred on wooden pattern equipment of an average kind.

None-the-less the book has a great deal to commend its inclusion in every students' library, and particularly are the questions at the end of each chapter worth studying and probing to the full. It is very good value for money.

B. LEVY.

Metallurgical Aspects of the Control of Quality in Non-Ferrous Castings—a Symposium held in London on May 1, 1957. Published by the Institute of Metals, 17 Belgrave Square, London, S.W.1; price 35s.

The scientific assessment of the factors governing the quality of castings is of considerable economic importance at the present time and the publication by the Institute of Metals of the eight papers presented at the Symposium entitled "Metallurgical Aspects of the Control of Quality in Non-Ferrous Castings" held last May—together with the general discussion—is therefore very welcome.

Within the compass of just under 150 pages are to be found papers dealing not only with general considerations—such as Metallurgical Principles (by R. W. Ruddle and A. Cibula); the Rôle of Statistical Methods (by A. R. Martin), and Non-destructive Testing (by S. L. Fry)—but also papers directed towards specific groups of alloys. The latter include papers on quality control of aluminium-alloy castings (by A. V. Carless); of copper-base castings (by A. R. French); of magnesium-base castings (by E. F. Emley and P. A. Fisher); of nickel-alloy sand castings (by D. R. Wood and J. F. Gregg), and of pressure die-castings (by H. J. Sharp). This publication, which deserves a very wide circulation, can be given wholehearted recommendation.

J. E. GARSIDE.

Publications Received

1933-1958 Britannia Iron and Steel Works, Limited, Bedford.

Before the 1914 war, the manufacture of tube-fittings in this country was but poorly developed. American, French, and Swiss founders had their selling agencies in London, but when trench warfare became highly developed and the need for fittings for pipes carrying telephone lines became insistent, there were supply difficulties, and the UK plant was built. Mr. Osborne, of Le Bas Tube Company, Limited, which represented George Fischer of Schaffhausen, was very active in the initial stages, and often consulted the reviewer on questions arising out of the new venture. This 16-page booklet issued to celebrate the silver jubilee of the foundation of the firm, rightly includes something of the history of James and Frederick Howard, Limited, who originally built the works about a hundred years ago to manufacture agricultural implements. Quite a good "popular" description is given of the manufacture of tube fittings. Finally, congratulations are due to the company on its 25 years of successful operation.

BSFA Bulletin, Vol. 2, No. 7. Methods Study. Issued by the British Steel Founders' Association, Broomgrove Lodge, Broomgrove Road, Sheffield, 10.

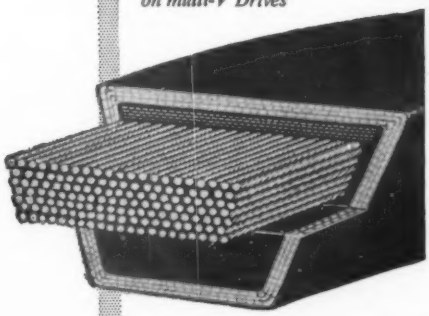
Some 25 years ago, after a trip by the reviewer to the Continent, a report was printed about a large steel foundry which operated a "jury" system. For the functioning of this system, each day a panel of retired foremen decided from blue prints and patterns exactly how and with what materials each casting should be made. This new *Bulletin* emanating from the steelfounders of this country advocates exactly the same system, but the retired foremen have been replaced by specialists and the name altered to the "Methods-study Department." Now also, the functions have been much more clearly defined. An example of one job is detailed in the *Bulletin* along with the advantages to be derived from the organization of such a department. The subject matter is clearly written and the arguments used are convincing.

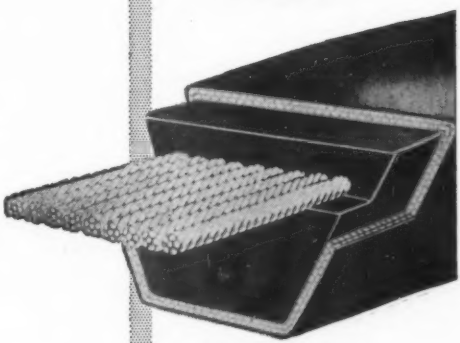
Welding Data Book. Issued by the Eutectic Welding Alloys Company, Limited, North Feltham Trading Estate, Faggs Road, Feltham, Middlesex.

This book is of American origin, the Middlesex company manufacturing under licence from the original publishers. The introduction is alike useful and practical; the first detailed section of 17 pages is that devoted to cast iron. Each page deals with one type of rod, giving its uses and characteristics. Other metals dealt with in the booklet are steel, stainless steel, brass, bronze, aluminium and magnesium. The book is capable of improvement by re-editing to give the normal English units of temperature and strengths.

V-BELTS THAT ARE BUILT TO LAST!

on multi-V Drives





and on F.H.P. Drives

YOU BUY ENDURANCE when you buy Goodyear V-Belts, made in types and sizes to suit every job from the largest multi-V installations to small F.H.P. drives. Longer belt life, more efficient transmission, less risk of costly shutdowns — these are the positive benefits of making good use of the Goodyear 'job-designed' range of belts which are backed by more than fifty years' experience in rubber engineering.

To be sure of longest, most economical performance it pays to consult Goodyear or your Goodyear Industrial Distributor, who will recommend a suitable belt, and also advise on installation and maintenance.

GOODYEAR

V-Belts · Conveyor Belting · Transmission Belting · Hose · Fenders

THE GOODYEAR TYRE & RUBBER COMPANY (GREAT BRITAIN) LIMITED · WOLVERHAMPTON

Imports and Exports of Iron and Steel in February

The following tables, based on Board of Trade returns, gives figures of imports and exports of iron and steel in February. Totals for the first two months of this year and last are also included.

Total Exports of Iron and Steel

Destination.	Month ended Feb. 28.	Two months ended February 28.	
	1958.	1957.	1958.
	Tons.	Tons.	Tons.
Channel Islands	403	537	774
Cyprus	723	1,386	1,285
Sierra Leone	362	2,938	1,977
Ghana	622	3,316	2,514
Nigeria	3,923	9,726	11,883
Union of South Africa	9,013	17,311	16,806
Rhodesia and Nyasaland	3,166	12,052	7,083
Tanganyika	1,180	4,340	2,045
Kenya	2,496	6,243	7,091
Uganda	315	788	526
Mauritius	735	662	970
Aden	402	831	1,071
Bahrein, Qatar, and Trucial States	907	1,577	1,648
Kuwait	3,729	4,826	5,980
India	9,300	54,849	21,527
Pakistan	7,334	5,758	21,340
Singapore	3,826	8,164	7,239
Malaya	2,201	8,126	3,321
Ceylon	2,750	5,529	5,223
British North Borneo	153	548	356
Hongkong	4,176	23,198	7,988
Australia	5,683	38,100	15,935
New Zealand	17,798	22,828	34,530
Canada	15,339	34,037	30,121
Jamaica	2,087	2,314	4,076
Trinidad	5,431	5,777	9,566
British Guiana	616	824	1,051
Other Commonwealth countries	2,037	5,607	5,209
Eire	4,611	7,699	8,451
Finland	3,510	15,280	8,120
Sweden	13,371	16,749	24,085
Norway	8,062	19,362	16,030
Denmark	10,595	17,725	16,566
Western Germany	1,078	4,736	1,493
Netherlands	7,040	20,528	12,423
Belgium	1,450	5,932	4,576
France	221	3,368	392
Switzerland	1,031	4,086	2,208
Portugal	1,078	3,268	2,492
Spain	5,543	5,246	8,921
Italy	2,715	12,130	6,189
Austria	2,387	577	3,027
Yugoslavia	201	777	858
Greece	2,090	1,257	3,382
Turkey	425	1,590	907
Netherlands Antilles	55	1,083	205
Portuguese East Africa	372	631	615
Egypt	3,145	—	6,105
Sudan	3,226	5,375	5,844
Lebanon	2,536	522	3,841
Israel	750	609	1,276
Saudi Arabia	1,258	1,257	1,380
Iraq	1,395	5,381	5,425
Iran	1,207	7,888	4,746
Burma	636	2,639	1,672
Thailand	418	939	1,196
Indonesia	188	479	651
Philippine Republic	427	151	479
USA	7,386	5,908	12,434
Cuba	293	712	951
Colombia	689	646	1,488
Venezuela	8,798	12,084	17,363
Ecuador	657	518	1,001
Peru	748	1,468	2,298
Uruguay	58	1,262	366
Argentina	10,547	10,612	25,821
Other foreign countries	11,804	31,912	23,531
TOTAL	228,608	514,578	467,943

THE GAS COUNCIL arranged for 31 boys, drawn from public schools throughout the country, to spend five days during the Easter holiday seeing the gas industry from the inside. They visited the installations in the Derby area.

Total Imports of Iron and Steel

From	Month ended Feb. 28.	Two months ended February 28.	
	1958.	1957.	1958.
	Tons.	Tons.	Tons.
Rhodesia and Nyasaland	359	623	1,002
Canada	1,092	5,749	3,259
Other Commonwealth countries and Eire	2,508	3,501	4,430
Soviet Union	11,716	29,476	26,312
Sweden	2,861	6,184	5,600
Norway	6,957	21,420	13,663
Poland	15	1,827	15
Western Germany	6,058	18,999	12,564
Netherlands	9,067	13,342	24,547
Belgium	10,404	30,699	18,845
Luxembourg	676	8,149	1,552
France	1,657	16,830	6,694
Italy	8	614	49
Austria	535	19,508	1,077
Japan	258	3,152	641
USA	23,069	23,472	53,352
Other foreign countries	131	7,887	699
TOTAL	77,371	211,432	174,301
Iron and steel scrap and waste, fit only for the recovery of metal	4,661	96,487	28,304

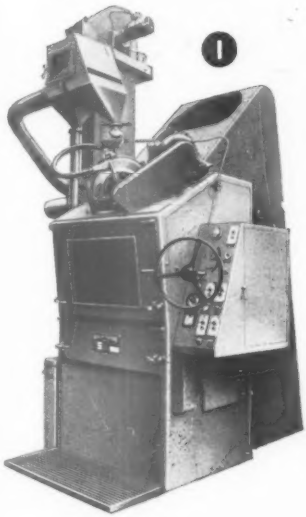
Exports of Iron and Steel, by Products

Product.	Month ended Feb. 28.	Two months ended February 28.	
	1958.	1957.	1958.
	Tons.	Tons.	Tons.
Pig-iron	5,256	40,744	11,143
Ferro-columbium (niobium)	1	22	5
Ferro-tungsten	5	149	36
Other ferro-alloys	240	635	512
Ingots, blooms, billets, slabs, sheets, and tinplate bars	223	321	2,242
Iron bars, rods, angles, shapes, and sections	93	242	189
Steel bars, rods, angles, sections, and shapes	34,943	82,982	65,337
Iron plates and sheets	334	36	334
Universal plates	320	563	612
Steel plates, ⅛ in. and under ¼ in.	946	1,958	1,562
Ditto, ¼ in. and over	19,082	31,000	32,769
Blacksheets and blackplate	26,562	55,620	58,551
Hoop and strip	4,456	16,053	9,659
Tinplate	31,931	61,633	56,046
Decorated tinplate	219	601	505
Galvanized sheets	4,745	33,530	10,065
Other (incl. tinned sheets, terne-plate, and ternesheets)	1,129	4,320	2,482
Railway and tramway construction material	17,328	45,864	42,490
Wire rods of steel (incl. alloy steel)*	3,434	6,965	7,046
Wire	8,666	15,902	18,143
Tubes, pipes, and fittings	67,595	113,295	146,028
Iron castings	175	215	531
Steel castings	224	657	504
Forgings	701	1,271	1,152
TOTAL	228,608	514,578	467,943

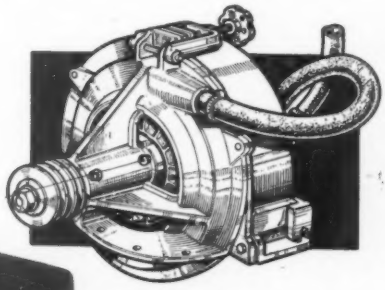
* The figures for 1958 are not completely comparable with those for previous years.

THE raw materials division of George Cohen Sons & Company, Limited, is now at Trinity Road, Kingsbury, Tamworth (Staffs) (telephone: Hurley 281-2 and Ashfield 1191-3).

Shot Blast Equipment

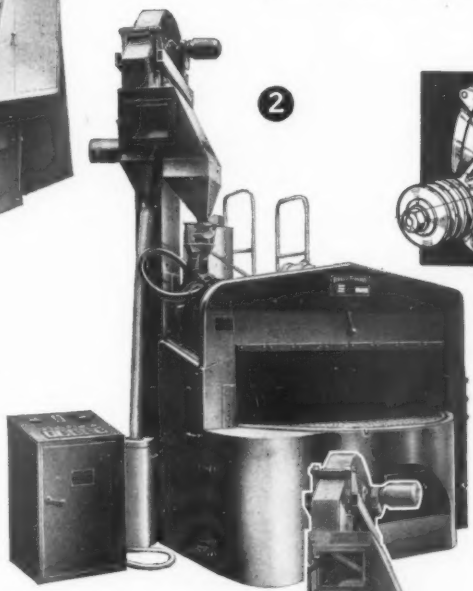


This A-S-L Turbine is the most modern Shot Blasting Unit available. The bi-phase air injection system enables shot to be projected at greater speeds using lower power with fewer replacements. The economies effected in spare parts alone are very substantial.



Baker Perkins High Speed Bi-Phase A-S-L Turbine, British Patent, No. 510681.

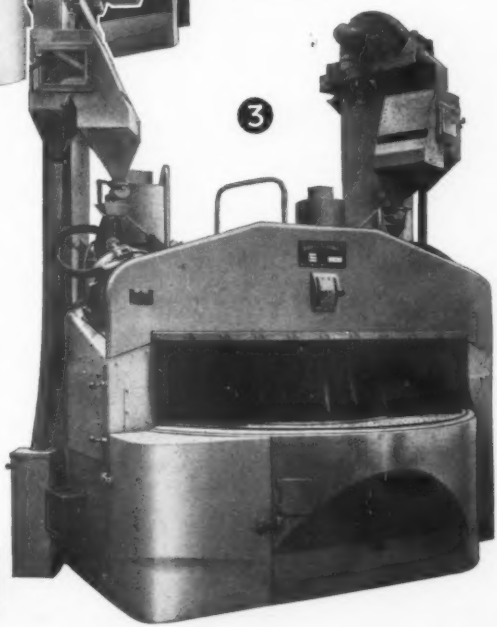
These machines do not require pits or special foundations.



1 ROTARY BARREL

2 CADET

3 MEDIUM



Our standard range of Rotating Barrel and Table Shot Blast Machines is capable of handling a wide range of Foundry products. Both types are semi-automatic, the rotating barrels being equipped with skip hoist loading gear and frontal discharge mechanism. These modern highly efficient machines are in use in Foundries all over the world, and are built to the high standards of design, materials and workmanship characteristic of all Baker Perkins' machines.

BAKER PERKINS LIMITED
ENGINEERS
WESTWOOD WORKS · PETERBOROUGH

Pig-iron and Steel Production

Statistical Summary of January Returns

The following particulars of pig-iron and steel produced in Great Britain are from statistics issued by the British Iron and Steel Federation. Table 1 summarizes activities during recent months. Table 2 gives production of steel ingots and castings in January. Table 3, weekly average production of finished steel in December 1957. Table 4 gives the production of pig-iron and ferro-alloys in January, and furnaces in blast. (All figures are weekly averages in thousands of tons.)

TABLE 1.—*Iron and Steel Price Index and General Summary of Pig-iron and Steel Production.*

Period.	B.o.T. Price Index, 1938 = 100.			Iron-ore output.	Imptd. ore used.	Coke to blast-furnaces.	Pig-iron, ferro-alloys prod.	Scrap used in steel prod.	Steel (incl. alloy).			
	I. & S.	Coal.	Basic materials excl. fuel[1]						Imports.[2]	Prod. ingots, castings.	Delivrs. finished steel.	Stocks.[3]
1955	276	399	529	311	244	246	240	213	29	381	305	1,247
1956	295	454	542	312	272	264	253	216	27	397	318	1,444
1957—Sept. ..	342	501	525	326	313	271	283	233	13	438	339	1,635
Oct. [4] ..	343	497	516	330	322	274	285	232	10	438	340	1,574
Nov. ..	342	511	508	317	319	273	282	229	16	429	359	1,492
Dec. ..	342	512	501	276	313	265	276	206	13	398	314	1,444
1958—Jan. ..	342	511	493	299	303	260	271	214	15	407	—	1,406

TABLE 2.—*Weekly Average Production of Steel Ingots and Castings in January*, 1958

District.	Open-hearth.		Bessemer.	Electric.	All other.	Total.		Total ingots and castings.
	Acid.	Basic.				Ingots.	Castings.	
Derbys, Leics., Notts., Northants, and Essex ..	—	5.0	11.0 (basic)	2.6	0.1	17.1	1.6	18.7
Lancs. (excl. N.W. Coast), Denbigh, Flints, and Cheshire	1.5	36.7	—	2.5	0.5	39.7	1.5	41.2
Yorks. (excl. N.E. Coast and Sheffield)								
Lincs.	—	45.4	—	—	0.1	45.4	0.1	45.5
North East Coast	0.5	82.3	—	1.4	0.5	82.7	2.0	84.7
Scotland	2.0	38.2	—	2.2	0.1	40.5	2.0	42.5
Staffs., Salop, Worcs., and Warwicks.	—	19.6	—	1.3	0.8	19.9	1.8	21.7
S. Wales and Monmouthshire	2.8	77.6	7.4 (basic)	1.2	0.2	88.5	0.7	89.2
Sheffield (incl. small tonnage in Manchester) ..	8.4	35.6	—	12.0	0.4	54.3	2.1	56.4
North West Coast	0.1	1.0	5.6 (acid)	0.4	0.1	7.0	0.2	7.2
Total	15.3	341.4	24.0	23.6	2.8	395.1	12.0	407.1[4]
December, 1957	16.7	335.8	20.7	22.0	2.7	386.5	11.4	397.9
January, 1957[4]	19.0	343.0	26.8	24.2	2.9	404.0	11.9	415.9

TABLE 3.—*Production of New Non-alloy and Alloy Finished Steel.*

Product.	1956.	1957.	1956.		1957.
			Dec.	Nov.	Dec.
Non-alloy steel:					
Ingots, blooms, billets and slabs[5]	4.7	5.0	4.1	6.2	5.6
Heavy rails ..	9.7	11.2	9.9	11.8	12.2
Sleepers, etc. ..	1.8	2.1	1.9	2.0	2.5
Plates, 3mm. and over	50.2	54.2	53.9	59.5	57.9
Other heavy prod.	50.3	53.0	48.5	57.5	49.3
Ferro-con. bars ..	7.8	8.9	7.1	10.8	8.5
Wire rods	22.9	23.3	20.5	27.4	23.5
Arches, etc. ..	10.1	11.0	10.3	12.2	10.0
Other light sections	41.4	38.8	40.0	41.2	34.5
Bright steel bars ..	8.0	7.0	6.9	7.7	6.5
Hot-rolled strip ..	24.5	23.1	21.3	26.7	23.2
Cold-rolled strip ..	7.5	7.1	5.7	8.8	7.7
Sheets, incl. coated:					
(i) Hot rolled	15.0	13.0	11.8	14.7	13.0
(ii) Cold reduced	24.8	29.1	21.3	32.6	26.5
Tin- and terne-plate					
Blackplate.. ..	17.2	19.8	17.0	18.8	14.6
Steel tubes, pipes..	26.2	25.9	25.2	27.1	27.4
Tube, pipe fittings	0.5	0.5	0.4	0.5	0.4
Tyres, wheels, axles	4.6	5.1	5.1	5.7	4.9
Forgings (excl. drop forgings) ..	3.0	3.1	3.1	3.5	3.3
Steel castings ..	4.5	4.6	4.4	5.2	4.3
Tool and magnet steel	0.3	0.3	0.3	0.3	0.3
Total	335.0	346.1	318.7	380.2	336.1
Alloy steel	17.3	17.8	15.7	20.7	18.2
Total deliveries from UK prod.[6] ..	352.3	363.9	334.4	400.9	354.3
Add: Imported finished steel ..	19.5	9.6	12.0	15.1	12.3
	371.8	373.5	346.4	416.0	366.6
Deduct: Intra-industry conversion[7] ..	55.2	52.5	51.4	57.7	54.0
Total new material ..	316.6	321.0	295.0	358.3	312.6

TABLE 4.—*Production of Pig-iron and Ferro-alloys during January*, 1958

District.	Furnaces in blast.	Hematite.	Basic.	Foundry.	Forge.	Ferro-alloys.	Total.
Derbys, Leics., Notts., Northants, and Essex	23	—	19.8	23.2	0.7	—	43.7
Lancs. (excl. N.W. Coast), Denbigh, Flints. and Ches. ..	7	—	20.8	—	—	1.7	22.5
Yorkshire (excl. North East Coast and Sheffield)							
Lincs.	10	—	42.3	—	—	—	42.3
North East Coast	21	4.2	58.2	—	—	1.2	63.6
Scotland ..	8	0.4	19.3	1.4	—	—	21.1
Staffs., Salop, Worcs., and Warwick ..	6	—	7.3	1.8	—	—	9.1
S. Wales and Mon.	11	4.5	41.6	—	—	—	46.1
Sheffield	2	—	3.5	—	—	—	3.5
North-West Coast	8	17.4	—	0.2	—	1.5	19.1
Total ..	96	26.5	212.8	26.6	0.7	4.4	271.0[4]
December, 1957	96	28.0	218.5	23.6	1.1	4.3	275.5
January, 1957[4]	97	29.5	193.7	30.4	0.7	2.6	256.9

[1] Used in non-food-manufacturing industry.
[2] Weekly average of calendar month.
[3] Stocks, mainly ingots and semi-finished, at the end of the years and months shown.
[4] Five weeks, all tables.
[5] Other than for conversion into any other form of finished steel listed.
[6] Includes finished steel produced in the U.K. from imported ingots and semi-finished steel.
[7] Material for conversion into other products also listed in this table.